THE IRON TRADE REVIEW

Volume LIII CLEVELAND, SEPTEMBER 4, 1913 *No. 10*

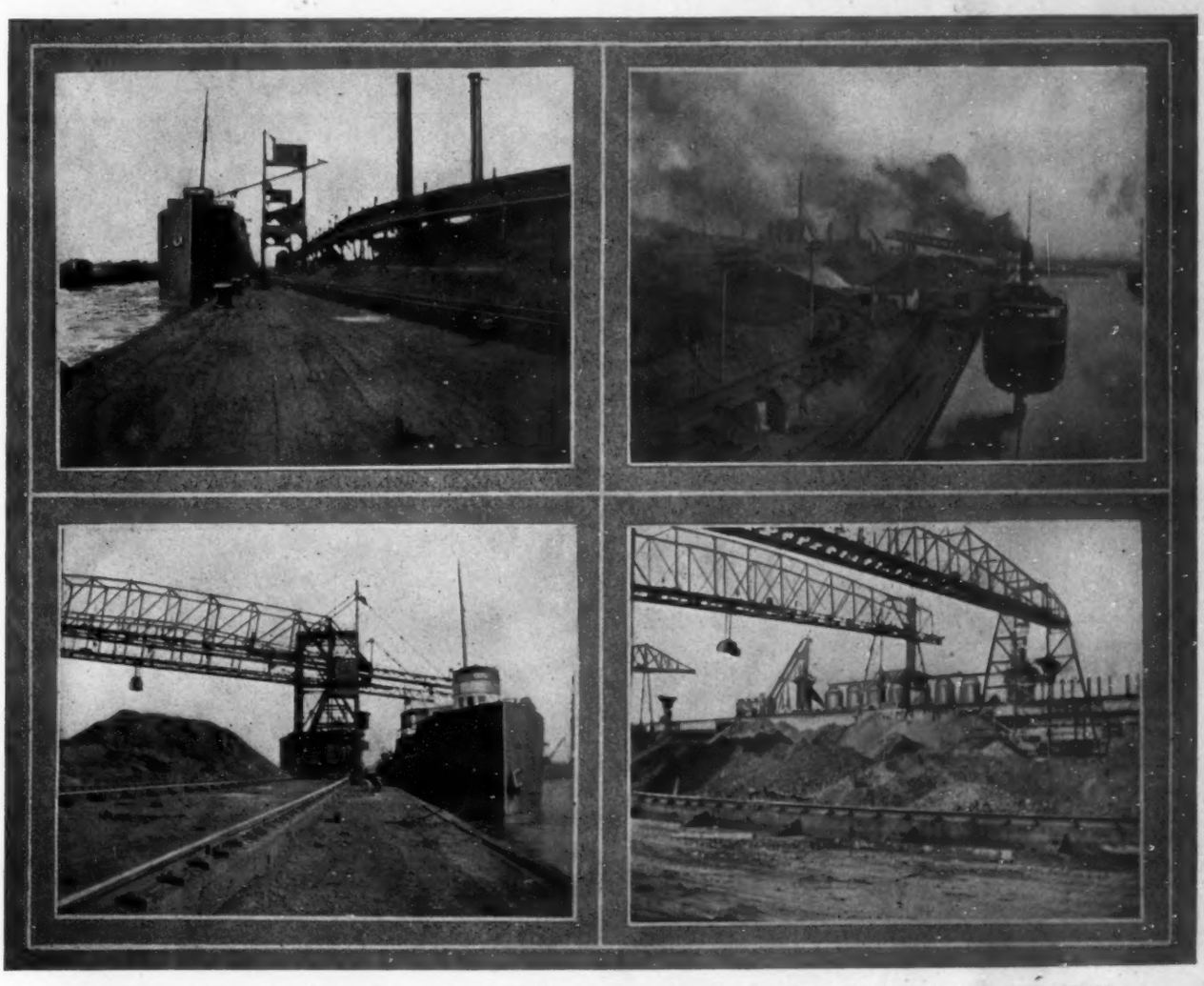
A Passing View of Steel Operations at the Soo

Descriptive Sketch of the Iron and Steel Plant of the Algoma Steel Corporation at Sault Ste. Marie, Ont.

By R D Williams

THE plant of the Algoma Steel Corporation, Sault Ste. Marie, Ont., embraces an area of over 100 acres and is exceedingly well-arranged for the expeditious handling of material. At present the output is devoted exclusively to steel rails, splice bars and tie plates. The rail mill is running night and day, producing 1,200 tons of rails every 24 hours, while the merchant mill operates in the day time only, running three days per week alternately on splice bars and tie plates. The demand for these products from the Canadian railways is heavy and the plant is booked for over a year ahead. In fact, it could market 2,000 tons of rails per day were it able to produce them. Two-thirds of the steel produced in the plant is Bessemer at present, though it is the intention of the management to gradually reverse this proportion and to eventually make the plant an open-hearth proposition exclusively.

During the present season the Cor-



PERSPECTIVE VIEW OF COAL RIG AND TRESTLE
THE FRATER UNDER THE ORE UNLOADERS

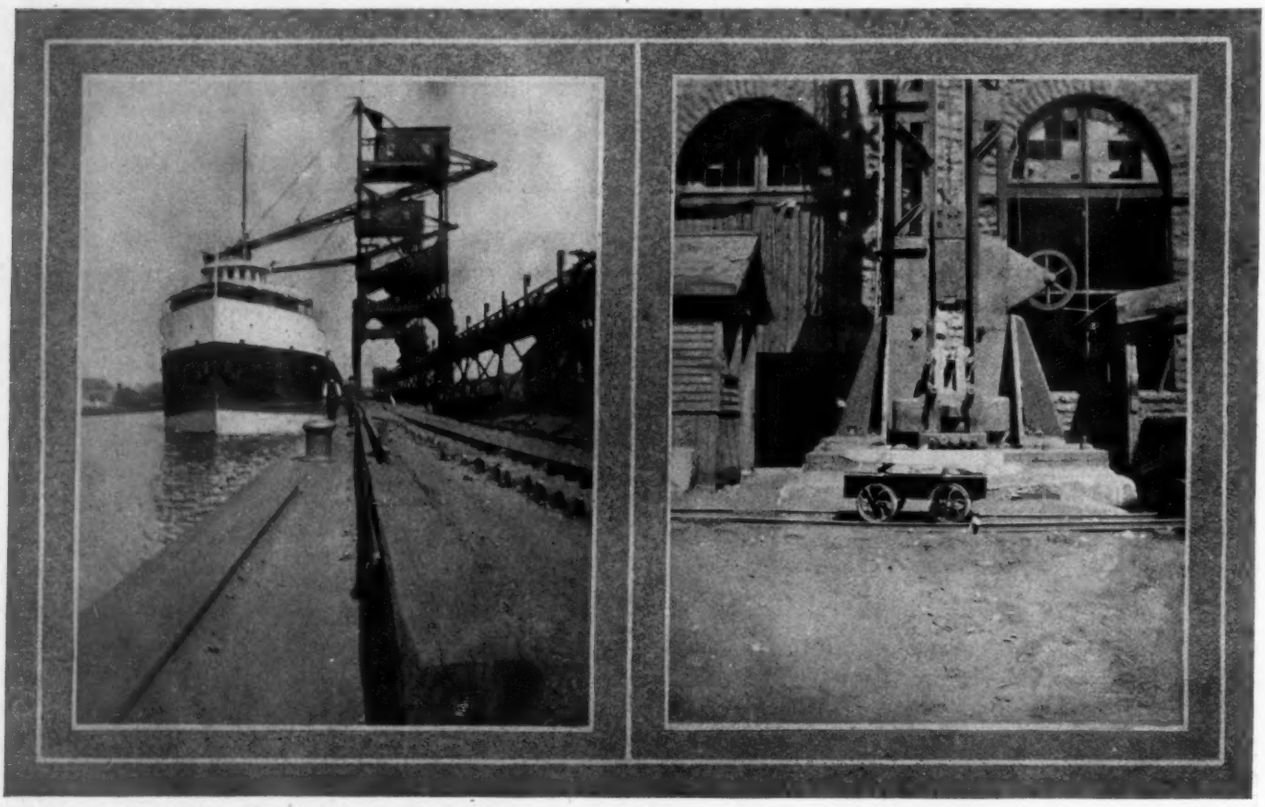
VIEW OF ORE UNLOADERS AND ORE PILES
ORE BRIDGE AND STOCK PILE WITH FURNACE IN DISTANCE

poration is receiving but little ore from its Helen Mine in the Michipicoten district, selling the output to other consuming interests. It is operating No. 1 furnace with 70 per cent Canadian ore from stock pile and is using some ore from its Magpie mine which, however, has to be roasted. The Corporation has three furnaces—two 250-ton and one 450-ton —and handles over its docks about 600,000 tons of ore per annum.

The ore handling equipment was installed by the Wellman-Seaver-Morgan Co., Cleveland, and consists of three machines operating 3-ton, self-filling buckets and is capable of unloading about 134,000 tons a month. The three machines rarely work in a boat simultaneously, one of them being usually employed constantly in charging the furnaces. The ore buckets dump in storage and can also unload directly into cars for charging the furnace bins, from which place the ore is carried by belt conveyor to the skips which travel to the furnace mouth. Two vessels have recently been added to the ore carrying fleet—the Franz and Frater — (formerly the Uranus and Saturn of the Gilchrist line) and carry about 5,500 tons each. The average time unloading and taking care of furnaces meanwhile is 27 hours, which is a fair performance, considering the distances that the buckets have to travel to stock pile and furnace cars. Like everything else about the plant, the ore unloading machinery is electrically-driven.

The coal-handling equipment was installed three years ago and is of the Heyl-Patterson type, consisting of two rigs operating 3-ton buckets. This is a very interesting installation. While it was only guaranteed to unload a 10,000-ton steamer in 48 hours, it has been speeded up to do the job in 32 hours, and with certain modifications, which the experience of the past three years has demonstrated the wisdom of, can be made to do even better. With the installation of another unit vessels can be assured of rapid dispatch at this dock. The design of the equipment is excellent and conducive to dispatch and the only criticism of the present installation that can be made is that it is a trifle light for the work and temporary breakdowns are, therefore, to be expected. When they do occur, the work of unloading is thrown upon one rig, which makes for delay. The secret of rapidity of dispatch in this installation lies in the short distance that the buckets have to travel. The buckets unload into a hopper, which is carried on the rig, and as the whole equipment operates on tracks, the outer rail of which is within 3 or 4 feet of the face of the dock, it can be seen that the distance from the vessel's hold is very short. In fact, observations taken at random indicated that the buckets averaged a round trip in less than 45 seconds.

The operation of the bucket and the movement of the rig along the tracks to get in line with the hatches are both controlled by an operator carried in the rig; but he has no control over the hopper itself. The hopper has a capacity of about 80 tons and discharges into a car, which not only carries its own motive power, but through a plug connection with one of the legs of the rig controls the hopper bottom as well. The operator in the car, therefore, as soon as he gets under the hopper, inserts the plug connection, opens the hopper bottom and receives his load. He then closes the hopper bottom, withdraws the plug, and carries the coal to the storage pile. The cars, operating on the third rail system, are carried on a trestle work and dump their loads at will on either side of the trestle. They are designed to carry 20 tons, but in actual practice carry about 22 tons, which they dump in from two to three seconds, returning immediately to the hopper for another load. As the capacity of the hopper is about four times that of the car, the unloading buckets are never delayed waiting for the car to return. One car can conveniently take care of one



THE BULK FREIGHTER ISHPEMING UNDER THE COAL UNLOADING RIG

TESTING SECTIONS OF STEEL RAILS

hopper, though a third car is held in reserve should anything happen to either of them. This unloading equipment will conveniently handle from vessel to stock pile, 175,000 tons per month.

Reversing Blooming Mill

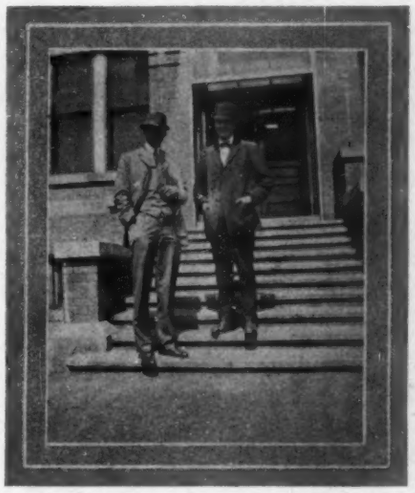
As stated, everything about the plant is electrically-driven and the simplicity of operations is amazing. The blooming mill is operated by an electric reversing equipment designed to roll 75 tons per hour from ingots 20 x 20 inches, into billets, 8 x 8 inches, in 15 passes. The rolls are driven by two 600-volt direct current motors mounted on the same shaft. The reversal is made in about three seconds.

The rail mill is a model of its kind. Three sections of a rail from every heat are tested under a drop hammer and if cracks result in two of the three sections, the entire heat is rejected. The operation of the mill is practically automatic even to the loading of the railway cars, which enter the mill upon sunken tracks, the rails sliding upon the cars broadside from the rolls. The cars are then made up into trains for the Algoma Central railway or are merely switched to the dock to be unloaded into steamers operated by the Algoma Central Steamship Line, which controls a fleet consisting of the steamers Agawa, Franz, Frater, Thomas J. Drummond, Leafield and Paliki.

The coke ovens, built by H. Koppers, Joliet, Ill., are designed on the principle of conservation of resource and demonstrate clearly the wastefulness of the bee-hive oven, of which there are plenty yet left in the Connellsville region. These ovens not only supply sufficient gas for all the furnaces in the boiler plant, but furnish a surplus which is piped to two leading industries at the Sault. The by-products are sulphate of ammonia and tar. Both find a ready sale. The sulphate of ammonia is in good demand as a fertilizer, bringing $70 a ton, and is shipped all over the continent. The tar is sold to a customer in Sault Ste. Marie. This conservation pays for the cost of the raw coal.

Coking Coal

The coal for coking is conveyed from the boat either to storage or the coal hopper. It is carried from these hoppers by a belt to the coal breaker and crusher building, where it is broken and the iron particles removed by a magnetic separator. The coal is then crushed and conveyed by a belt to mixing bins, from which it is carried to the 2,000-ton coal storage bin. By means of hand-operated gates, which are located in the bottom of the coal storage bin, the coal charging car receives the coal from the bin for charging direct into the tops of the ovens. The coal is baked from 18 to 24 hours and the ovens have a producing capacity of 1,200 tons per day. The means of emptying the ovens is both interesting and picturesque. A pushing machine, operating on one side of the oven, literally pushes the coke out through the other side. As it emerges from the oven in a compact and practically incandescent cake parallelogram in form, portable, latticed gates guide it across the pusher platform, over the edge of which it falls into a waiting car, in which it is immediately taken to the quencher, where liberal streams of water are poured upon it. It is then conveyed either to storage or directly to the furnace.



SAMUEL HALE, GENERAL MANAGER, AND C. E. DUNCAN, GENERAL SUPERINTENDENT

The Corporation's gas engine equipment consists of nine units, housed in an imposing structure, and all are driven by gas from the blast furnaces. The equipment consists of four blowing and five power engines. There is also an emergency steam plant, consisting of a reciprocating engine and a turbine, which are driven by the exhaust steam.

Concerning the personnel of the Algoma Steel Corporation, its distinguishing characteristic is its youthfulness. It has been found practically impossible to transplant to so comparatively remote a settlement the older element bred in the Pittsburgh district and the reason is not far to seek. Their homes are well established, their children going to school and their work secure and free from hazard. Therefore, why should they change? Not so with the younger element. The spirit of adventure and the great opportunities of a growing business appeal to them and that is why the rank and file of the Algoma Steel Corporation's force are all young.

Personnel of the Corporation

Samuel Hale, who was made general manager of the plant in October, 1912, received his early training at the South works of the Illinois Steel Co. He entered the employ of that company in 1894, and rose to the position of assistant general superintendent, leaving in 1902, to build a plant for the Deering Harvester Co. This plant was later taken into the International Harvester Co. and made a subsidiary of the Wisconsin Steel Co. Mr. Hale remained with the Wisconsin Steel Co. until his appointment as general manager of the Algoma Steel Corporation in October, last.

C. E. Duncan, general superintendent, has been identified with the steel-making industry since childhood. He started at Chattanooga in 1887, with his father, in the South Tredegar Iron Co.'s plant, and in 1892 joined the Carnegie Steel Co.'s forces as roller, in which capacity he served for ten years, or until the formation of the United States Steel Corporation, when he went to the National Tube Co.'s works at McKeesport as a roller. Mr. Duncan left the National Tube works, to go with the Cambria Steel Co. as assistant superintendent. In 1906 he went with the Bethlehem Steel Corporation as assistant to S. B. Sheldon, where he remained until 1909, when he accepted the position of general superintendent of the Algoma Steel Corporation.

J. E. McLurg, the assistant sales manager, was, until the beginning of the present year, the manager of the Algoma Central Steamship Line, in which office he has been succeeded by S. V. McLeod, formerly his chief clerk. Mr. McLeod started his career as office boy for F. H. Clergue and remained in the employ of the company until 1906, when he went with the Duluth Log Co. When Mr. McLurg was appointed manager of the Algoma Central Steamship Line in 1907, he recalled McLeod to succeed him as chief clerk.

Building Dock

J. A. MacColl, superintendent of docks and tracks, has been with the Corporation since 1900. He is a graduate of Queen's University, Kingston, and for a time taught high school. He later became interested in development work in the Hastings gold mining district in Canada, investigating

and purchasing properties on behalf of an English syndicate.

The Algoma Central railroad is now building a new coal dock at the Sault and is installing new coal handling equipment at Michipicoten, and it would seem as though some of the enterprises founded by F. H. Clergue with so much imagination and financial prodigality are destined to be great and growing successes.

Special Milling Machine

A machine particularly adapted to milling railway motor spiders and which, in addition, can be employed for key-seating, using end cutters only which are sunk to the full depth of the key-seat, the width and depth of the key-seat being milled in one operation, is shown in Figs. 1 and 2. For locomotive work, the machine, when desired, is equipped with a lower cutter support, which permits of milling piston rod key slots from the solid in one operation. The spindle saddle is counterweighted, has hand vertical adjustment with micrometer measuring gage and the work table has both in and out adjustment by hand for setting work to the depth of the cut and a reversing cross power feed with six changes.

The spindle revolves in bronze bushings, having straight and double taper bearings. The largest diameter of the spindle is 5½ inches, the spline end being 3 inches in diameter in the driving sleeve. The drive through the spindle is from a five-horsepower motor operating at from 400 to 1,200 revolutions per minute, by means of a continuous belt supported by the idler pulleys, *B*, Fig. 1, through the driving sleeve pulley covered by a guard, *C*. For heavy milling, the back gears have a ratio of 3.11 and may be engaged by the operation of the latch lever, *D*, Fig. 2. Vertical adjustment of the spindle saddle is controlled by the hand wheel, *E*, Fig. 2. The motor, Fig. 1, is mounted on a solid extension of the base. Power for the operating feeds is transmitted from the end of the armature shaft through gears mounted inside of the base to the speed box, *G*, Fig. 2, in which are located nine gears equally divided and mounted on sleeves controlled by the lever, *H*, to effect the different combinations. The reverse feed is controlled by another lever and the feed motion is transmitted through the long worm, *J*, Fig. 2, which meshes with the work wheel on the hub of which is a spur gear that engages the corresponding gear on the screw. The hand movement of the table is controlled by a hand wheel. A number of these machines also are used for die-sinking on work that weighs 1,000 pounds or more. This machine is built by the Newton Machine Tool Works, Inc., Philadelphia.

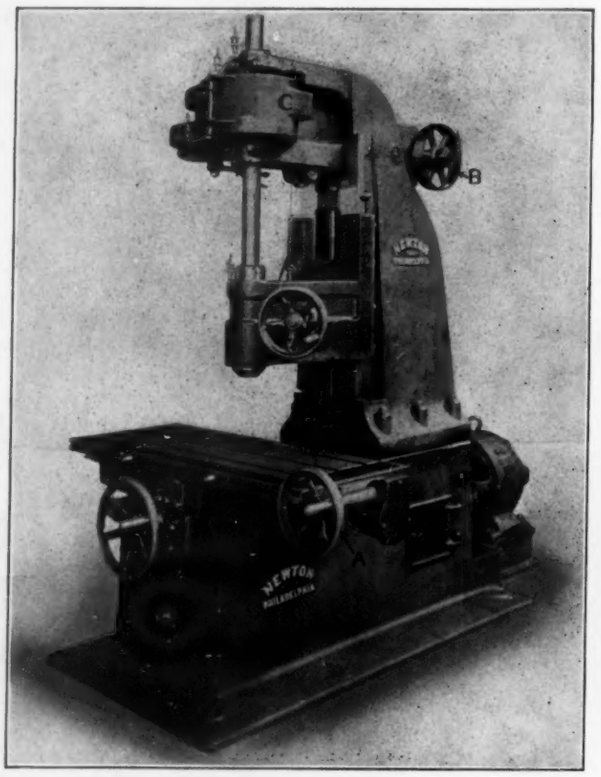


FIG. 1—SIDE VIEW OF MACHINE USED FOR MILLING RAILWAY MOTOR SPIDERS

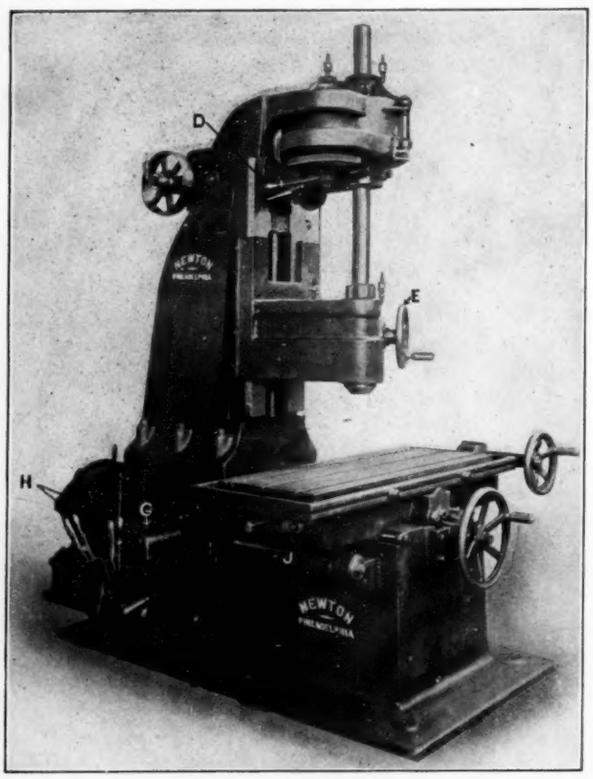


FIG. 2—ANOTHER VIEW OF THE MACHINE, SHOWING THE OPERATING LEVERS

Motor-Driven Boring and Turning Mills

H. Bickford & Co., Lakeport, N. H., have issued a circular illustrating and describing their motor-driven boring and turning mills in the 4, 5, 6 and 7-foot sizes, with 7-foot mills spread to 8 feet. The diameters of the tables are 49, 54, 62 and 73 inches, respectively, but on the 7-8-foot mill a special 90-inch table can be furnished. Each machine is designed to be driven by an adjustable speed motor, direct-connected to the driving shaft through gearing, the foundation for the motor being cast integral with the base. Thirty-six table speeds are obtainable. A separate motor is used for raising and lowering the cross-rail. A good many of these machines are being sold for export, and, when knocked down for shipment they occupy relatively little space, no more than 520 cubic feet being required for the largest size, with a gross weight of 34,000 pounds.

The year 1912 showed a considerable decrease in the importation of fluorspar, the imports being 26,176 short tons, valued at $71,616, against 32,674 short tons, valued at $80,616, in 1911. While the average cost to the consumer of foreign fluorspar in 1912 was $5.74, including duty but excluding freight charges, domestic spar cost $5.82.

Machine Tools Grouped for Highest Efficiency

How the Plant of the Raymond Bros. Impact Pulverizer Co. Was Arranged to Effect the Greatest Operating Economies

A new plant for the manufacture of pulverizing and grinding machinery, which has recently been built in Chicago by the Raymond Bros. Impact Pulverizer Co., illustrates in an interesting way what can be done with an irregular plot of ground and limited space by making a careful analysis of shop processes before laying-out the plans. The machines built by the Raymond Bros. company include heavy foundation castings, moving parts of ordinary weight and considerable sheet metal work. The company purchases its castings from local jobbing foundries and the plant, therefore, includes a machine shop, a sheet metal department and an erecting or assembling floor.

The property on which the plant was built has the form of an irregular pentagon; the north line is about 250 feet in length, the west frontage on North Branch street extends 224 feet, while the east boundary is only 85 feet. It is served by only one railroad track which extends along the eastern edge. This track is used both for receiving and shipping. It was clear at the outset that the main building must be on the north side of the lot, fronting on North Branch street, with its main axis lying east and west.

The Layout of the Plant

Fig 3 shows the layout that was adopted. The building, which is a steel and brick structure of the usual monitor type with unusually ample window area, is 240 feet long and 80 feet wide. The main aisle, which is spanned by a traveling crane, is 30 feet wide and the two side bays are each 25 feet. A triangular extension is built on the southeast corner of the building for pattern storage. The plant was designed by W. E. Wood, consulting engineer, Harris Trust building, Chicago, and was erected under his supervision.

Before attempting to arrange the various departments in the shop and to lay out the machine tools, Mr. Wood made a careful study of the company's product and its manufacturing operations. A table was made showing the details, including the weight, of each piece in the largest machine built. This was followed by a study of the operations performed on the various parts, resulting in data showing the weights to be handled and the movements of each piece.

The main castings are heavy and it was clear that the erecting floor should be under the main crane and as near the loading track as possible. It was accordingly located near the center of the shop, as shown in Fig. 3. With the track only at one end of the building, some doubling back of the material handled was unavoidable, and since the stock for the sheet metal work was comparatively light, this department was placed in the northwest corner. The sheets are piled under the crane runway near the 10-foot gate shear.

An analysis of the machine tool operations showed that there are five parts in the standard pulverizer which must go to the boring mills and then to the erecting floor, while three pieces are transferred from the boring mills to the radial drills and four from the radials to the boring

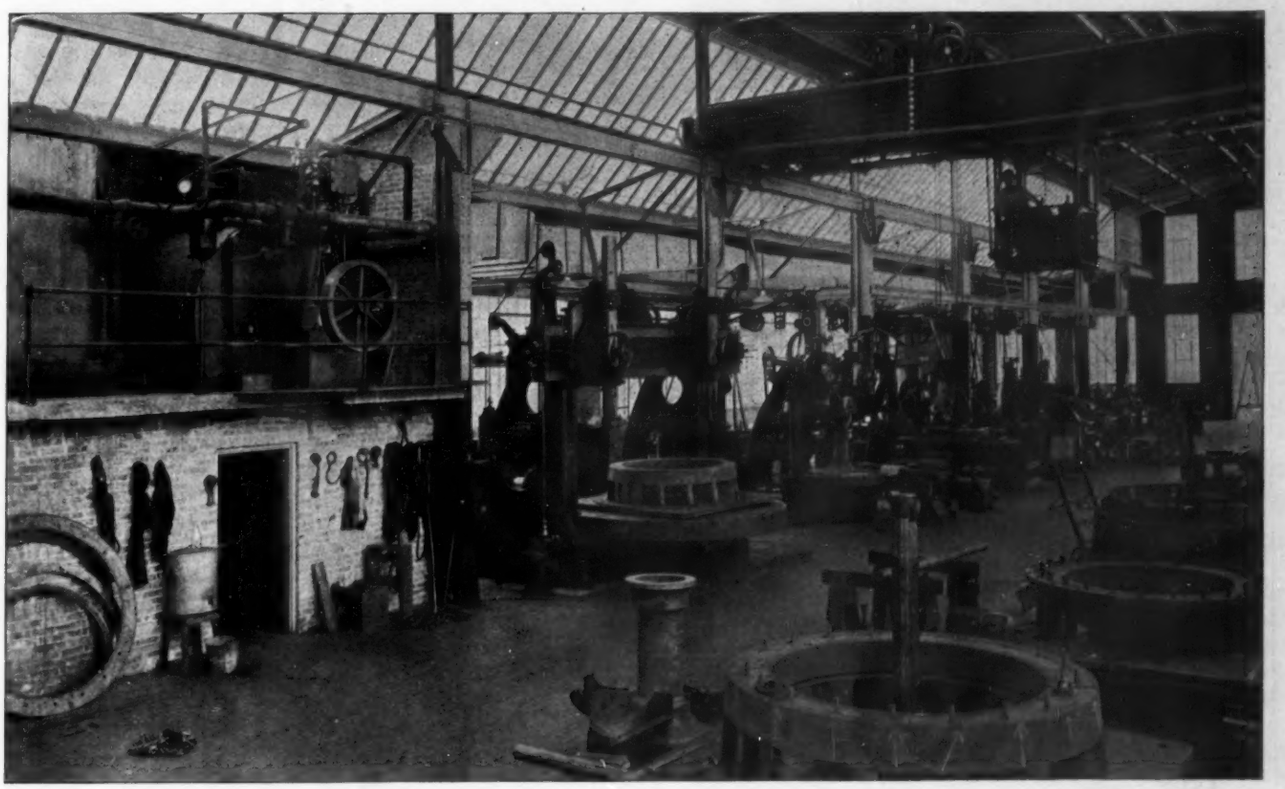


FIG. 1—HEAVY TOOLS AND VENTILATING EQUIPMENT IN THE SOUTH AISLE OF THE RAYMOND BROS. CO. MACHINE SHOP

FIG. 2—MAIN AISLE OF THE MACHINE SHOP, SHOWING MACHINE TOOLS AT THE RIGHT AND THE SHEET METAL DEPARTMENT AT THE LEFT

mills. There are also five parts which first go to the planers and are then transferred to the radial drills. On the other hand, only one piece is carried from the boring mill to the planers and thence to the erecting floor and only three parts are handled on the heavy lathes. Two of the latter, when turned, go direct to the erecting floor and one to the radial drills.

From the foregoing study it is clear that the boring mills, radial drills and planers must be as close to the erecting floor as possible and on account of the interchange of parts, the radials should be between the boring mills and planers. The heavy lathe operations, on account of their relative unimportance, can be relegated to the background. The product of the small parts lathes can be easily handled in the tote boxes and the location of these machines is, therefore, a secondary consideration.

Accordingly, the tools were grouped as shown in Fig 3. The boring mills, radial drills and planers are immediately opposite the erecting floor; the heavy lathes are under the crane runway at the west end of the shop, while the small parts lathes are in the southwest corner. All of the heavy tools project out under the crane. This arrangement permits the use of a 30-foot crane span instead of the 40 feet originally considered, thus materially reducing the cost of construction.

The crane, which was furnished by the Toledo Bridge & Crane Co., has a single hoist with a capacity of 7½ tons. It is designed for high speed. The operator's cab is placed under the middle of the bridge, instead of at one side, so that the craneman may have an uninterrupted view when transferring heavy pieces from the machine tools to the erecting floor.

The tool arrangement leaves the entire eastern third of the building free for handling shipments and other auxiliary operations. The small parts which are manufactured in quantities or purchased, are stored in a series of steel bins and racks back of the erecting floor.

In addition to the traveling crane in the main bay, the north aisle is

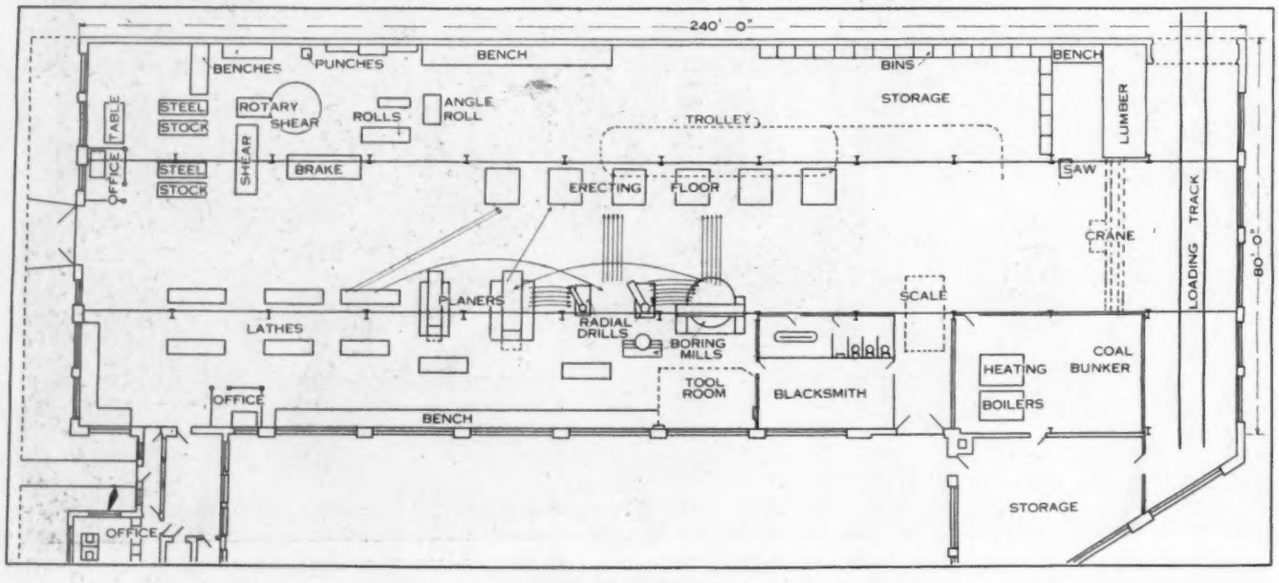


FIG. 3—LAYOUT OF THE RAYMOND BROS.' PLANT

fitted with an overhead trolley for handling material between the sheet metal department and the erecting floor. For receiving or shipping less than carload freight, there are two teamways, one entering on the west from North Branch street and the other through a private driveway. The latter crosses a scale at the east end of the shop as shown in Fig. 3. In the northeast corner alongside the loading track is space for a pile of crating lumber together with a bench and circular saw for making-up crates.

The loading track enters the building through a rolling steel door which is recessed 5 feet inside the wall for protection in switching. A red light burns over the doorway at night as a warning for engines or trains approaching on the spur track. A heavy I-beam, about 18 feet over the floor, extends between the columns in the south wall opposite the end of the loading track. If a car should accidentally be pushed off of the end of the track, no damage would result except the knocking-out of a small section of the wall under the beam.

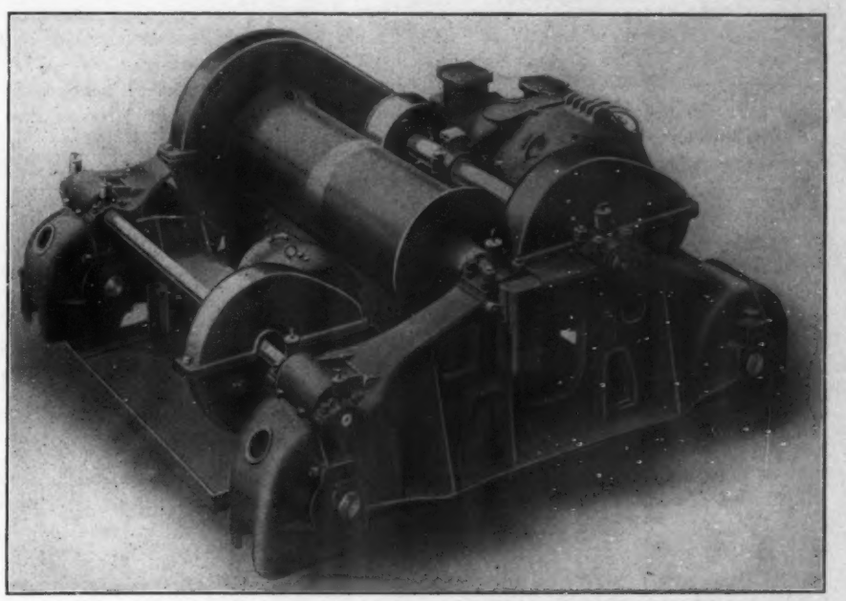
The tool room is centrally located behind the boring mills. The shop has central station power and the switchboards for controlling both the lights and the motors are in the tool room. This prevents anyone except authorized persons from manipulating the control panels. The larger machine tools are driven by individual motors while the lathes and small tools are belt-driven in groups. Ball bearing shaft hangers are used and a 20-horsepower motor suffices for all the machine tools except the planers and boring mills. Another motor serves the tools in the sheet metal department. The line and countershafting is suspended from wooden stringers fitted between the flanges of the roof truss I-beams in such a manner that the beams are not drilled or punched at any point. This will permit a convenient rearrangement of the shafting any time it may become necessary.

The shop is heated by steam on the indirect principle. Two low pressure cast iron sectional heating boilers have been installed for furnishing steam to the coils over which air is forced into the shop by a fan The fan, which is driven by a low pressure steam engine, is situated on a mezzanine floor over the locker and wash rooms. The general arrangement of the heating outlets is shown in Fig. 1.

The office is connected to the shop by a covered passageway which includes a separate entrance for the employes. The office building is 32 x 45 feet.

Mill Type Traveling Crane Trolley

A traveling crane trolley, particularly adapted to steel mill service and built by the Shaw Electric Crane Co., for which Manning, Maxwell & Moore, Inc., are the sole sales agents, is shown in the accompanying illustration. The trolley structure is steel throughout and comprises two heavy side frames connected by two rugged girts, one carrying the hoist motor and the electric brakes and the other supporting the trolley motor. Upper sheaves are mounted in a structural load girt supported by brackets on the side frames. By this construction the greater part of the load is borne independently of the girts which carry the hoist and trolley motors. The trolley truck journals are of the M. C. B. type with half-hexagon bronze bushings. The truck wheels are keyed to short axles which are interchangeable and the two wheels on one end of the trolley are independently driven from the cross shaft. The bearings are bronze-bushed and they are arranged to accommodate either oil ring or grease cup lubrication. All gears are machine-cut cast steel, while the pinions are cut from solid forged steel blanks. The gearing is entirely enclosed in substantial cases. A feature of this trolley is the fact that no gears are overhung and the drum gear is pressed on and keyed to the drum. The upper and lower sheaves are made of cast steel of the same diameter as the drum and together with the shaft pins and nuts, are interchangeable. The lower shafts are guarded by a steel casting fitted between the side plates and the hook swivels on ball bearings. The trolley is arranged to accommodate either the Shaw multiple-washer mechanical loading brake or dynamic lowering and when the latter is employed, two electric brakes are usually provided, one on the motor shaft extension and the other on the intermediate shaft. On all of the Shaw mill type cranes provision has been made for all the standard safety features required by the safety specifications of the United States Steel Corporation.



MILL TYPE TRAVELING CRANE TROLLEY

Pillar Crane

A pillar crane, the frame of which is designed to completely enclose one of the structural columns dividing the bays of a foundry, mill or other industrial plant and which enables the radius arm to be swung in a complete circle, has been designed by the Production Engineering Co., Philadelphia. The crane is equipped with a chain block hoist operating on two rails of the radius arm and is adapted for all classes of light lifting and carrying for floor work within the range of the crane. The latter being equipped with ball bearings, both top and bottom, can be very easily pushed around.

The B. F. Sturtevant Co., Hyde Park, Mass., has equipped a plant at Galt, Ont., for the manufacture of fans, blowers, ventilating apparatus, fuel economizers, steam turbines, vertical engines, generating sets, etc. From this plant the company will handle all business in Canada and will export to England, Australia and other foreign countries. The site consists of a plot 10 acres in extent and provides ample room for expansion.

Safety in the Lake Superior Iron Ore Mines---II

The Care Required in Properly Handling Explosives and Rules to be Followed

By Edwin Higgins

For underground work it is the general practice to use various grades of dynamite, such as straight dynamite, and the low-freezing, ammonia, gelatin and granular dynamites. Explosives are fired by means of fuse and detonator, except in shaft sinking, in which it is customary to use an electrical firing device.

In nearly all cases the explosive is carried into the mine in the original box, usually with the cover on, but in some cases with the cover removed. The best practice seems to be to remove the cover after the explosive is received underground, using a wooden mallet and wedge for the purpose.

Storage Underground. — Explosives are stored underground either in a central magazine or in boxes kept near the working places. The chief factor in determining the best method of storage is the system of mining in use. Under different conditions either method of storage may be best. In any event, no more than 48 hours' supply should be kept underground at any one time.

Powder houses should be removed from working places and traveling ways. Those cut out of solid rock, supported where necessary by steel and concrete, are safest. They should be in charge of a powder man who shall deliver explosives to the miner on written order only. In several mines the practice is followed of requiring the shift boss to make out and sign the order for explosives. It is claimed that this method is both economical and safe, as it prevents the miner ordering too much explosive, at the same time eliminating the habit of leaving sticks of explosives lying around promiscuously. The powder magazine should be electrically-lighted and no one should be allowed to enter with an open light of any kind. A good precaution is to place a fuse in the line leading to the powder magazine in order to prevent the explosion of an incandescent lamp in case the current should rise suddenly.

Fuse and Detonators.—The powder man should have charge also of the detonators and fuse and these should be kept in a room at least 50 feet from the explosives. The duties of the powder man may include the cutting of the fuse and the crimping on of the detonator, for which latter purpose a crimper should be supplied. There are still a few miners left who will crimp a detonator with their teeth.

Thawing

Thawing is variously performed. In cases where low freezing dynamite is used no means is provided for thawing. Some magazines are heated by steam coils and kept at a certain temperature. Thawing devices heated electrically or by steam pipes are used, as well as different types of hot water thawers. Electrical heaters require careful planning to prevent dangerous conditions due to short circuits or overheating. Only in a few cases was the dangerous practice of thawing in contact with a heated metal surface observed. Where steam is used for thawing it should be used under low pressure; exhaust steam from some source may be available. The practice of carrying sticks of explosives in the clothing in order to thaw them from the heat of the body should be prohibited.

Carrying Explosives. — In carrying explosives from the magazine to his working place the miner has been observed to make up a bundle of a dozen or more sticks and tie it up with a fuse; or he may carry the explosive loose or in a cloth sack. Obviously, the latter method is safest, because the explosive is better protected and is not likely to be lost.

Loading Detonator Into Primer.— There were few mines visited in which any regulation method of attaching the detonator to the primer was followed. In practically all cases the superintendents and captains knew that certain methods were to be preferred; the difficulty seemed to be in causing the miners to adhere to rules. Any method of performing this operation that allows the detonator to protrude from the primer, or the formation of sharp angles in the fuse, should be prohibited, as they give rise to premature explosions and misfires. A skewer of wood or brass should be used for punching the hole in the cartridge.

Tamping. — From a standpoint of both safety and economy, all explosives should be well tamped. For this purpose damp clay may be used; the tamping stick should be of wood.

In handling missed holes much care is generally used, although in some mines no set rule is followed. Usually some form of report is used whereby the captain or shift boss of the oncoming shift is notified of the missfire. The shift boss locates the hole, removes the tamping, then inserts and fires another primer. In locating the hole the shift boss may be guided by the experienced miner, who can designate in many cases, the charge that has failed to explode from the sequence of the reports. No set rules can be laid down for handling missfires. It may be said, however, that at least one hour should elapse before anyone is allowed to return to the hole; that great care should be observed in locating the hole and removing the tamping; that the charge should never be gouged out with a metal scraper; and that no attempt should be made to pull the fuse and detonator from the hole..

Black Powder.—For blasting on surface, as in open pits, various classes of black blasting powder are used. Care should be used in the storage and opening of the powder canisters.

Rules and Blasting Signals.—Rules and regulations concerning the handling of explosives should be printed and posted in proper places. Such placards should contain a few short and concise statements regarding the chief dangers in handling explosives.

Safety inspectors, or committees, are to be found at many of the mines, but a great number of them still depend upon the captains and shift bosses alone to keep the mine in a safe condition. The mines at which some form of inspection was provided showed the good results of the work. Constant contact with certain conditions may cause even the careful captain or shift boss to overlook the dangerous features.

While generously provided in a few cases and moderately in most, fire protection was found entirely lacking in some of the mines. As a protection to life and property every mine should be provided with some means of preventing and fighting fires, both on

the surface and underground. The aim should be to remove, as far as conditions and necessity will permit, the causes of fires; and to provide the necessary equipment for attacking quickly any fire which may originate.

Oxygen Breathing Apparatus

By the use of oxygen breathing apparatus, the wearer is enabled, without inconvenience, to perform hard labor in an atmosphere containing smoke, fumes or poisonous gases. This device is an important part of the equipment for fighting underground fires and may be instrumental in saving life where men are overcome or lost in gas-filled mines. The apparatus should be kept clean and should be tested at frequent intervals to make sure that it is ready for instant use. In storage, it should be protected from steam, hot air and dust. A sufficient supply of oxygen should be kept on hand at all times.

There should be two or more trained crews of five men each. If a crew consists of three or even four men and one of these men should meet with an accident, there is great danger that the two or three remaining men may not be able to carry him out of the danger zone.

From the standpoint of safety, first aid to the injured, where practiced, suggests to the miner that he is liable to injury; it protects the miner who has received an injury, and prevents simple injuries from developing into something more serious, thus shortening periods of disability.

In the generally accepted sense, first aid to the injured does not contemplate the production of physicians after a few lessons—or any number of lessons. Its purpose is to give temporary relief, by the simplest possible means, until the injured man can be taken to a physician or hospital.

The larger companies operating on the iron ranges, and many of the smaller ones, have taken up the work of first aid to the injured. In some localities the work is well organized and is doing a wonderful amount of good. Reports from one large hospital show that cases of infection have been reduced 50 per cent since the introduction of first aid work.

Sanitation and Ventilation

Sanitation and ventilation in mines are closely related to safety. A miner's general health is more valuable to him than a sound leg, arm or finger; and he will do more efficient work and be less liable to long disability when injured, if his general health is good. Unsanitary conditions in the mine, coupled with an insufficient supply of fresh air, will sooner or later show their effects upon the strongest man.

Practically all of the mine operators believe in the use of rules and regulations. This belief is exemplified in some cases by the official who at least posts a notice against smoking in certain places, or one refusing admittance to the mine or plant; passing through many gradations up to the official who believes in the printing of rules and regulations in eight or ten different languages. There can be no question as to the necessity of rules; and there seems to be no suitable method of reaching the men of various nationalities without printing these rules in numerous languages.

The important point, often difficult to attain, is the enforcement of these rules and regulations. The only satisfactory method of enforcing rules is to discipline, and finally discharge, offenders against them. Unfortunately, labor conditions are not always such that this course can be followed.

The Human Element

The human element enters into every angle of the safety problem. Rules may be provided, safety devices and precautions may be provided in the greatest abundance, and every preventive measure known to science may be brought into use; but they will not avail to reduce accidents to the minimum if the safety spirit is lacking in the officials, the captains, the shift bosses and the men under them.

For instance, such an experience as the following is not uncommon. An official goes underground and finds certain dangerous conditions existing, against which there are strict and clearly worded rules. These rules might not have been observed for any one of several reasons. The captain might not have been sufficiently impressed with the *safety first,* idea; the captain might not have educated his shift boss sufficiently; or either the captain or shift boss might have been of that type who cannot adjust himself to ideas of safety as against ore production.

The remark has been heard that this or that captain or shift boss could not be brought to give serious attention to matters of this kind; that they were too valuable to discharge and would doubtless come around to the changed conditions later. In cases of this kind it seems to be a question of which man is the most valuable, the man who gets out ore without injury to his men, or the man who produces a greater tonnage at the cost of human life. This is a question that may be studied either from a humane or from an economical viewpoint.

Interested in Safety

It is the rule on the iron ranges to find the mine officials greatly interested in safety, and the same may be said of the captains. However, the general run of shift bosses do not present a fertile field for the safety seed; either that, or the seed is improperly sowed. This does not refer to all shift bosses, for there are many safety enthusiasts among this class; nor does it mean to imply that a shift boss would willingly or knowingly put a man in a dangerous position. The idea that it is desired to bring out is that, in general, the safety spirit is high with the average official, and most of the captains; but when it reaches the shift bosses it begins to die, and by the time it comes down to the miner it is almost dead. The average miner resents suggestions for his safety. He will take care of his dinner pail and he will be careful to get all that is coming to him from his contract, but he will not take the necessary precautions to safeguard his life. Of course, there are some who are careful.

In many of the mines the captains and shift bosses are looked to for the reduction of the accident list. Another class is made up of those mines which have one or more safety inspectors. Still another class embraces the mines of the larger companies that maintain safety departments and spend a great deal of time and money looking to the welfare and safety of the men in and about the mine.

Of the schemes for securing the cooperation of the captains and shift bosses there is none that seem to bring better results than the monthly or semi-monthly meetings at which accident reports are read and the accidents, with possible suggestions as to how they might have been prevented, discussed. In some cases rivalry is stirred up amongst the shift bosses by offering small monthly prizes to the boss whose record for injuries to men is the cleanest.

Value of Bonus

The writer is of the belief that a yearly cash bonus to shift bosses, based upon the number of men injured (or the number of days disability resulting therefrom) and killed, will be effective in reducing accidents. The cash bonus is a suggestion; the plan in detail must be worked out with careful regard to the conditions under which the men work. One ob-

jection that has been heard is that conditions in one place might be more dangerous than in another, in this way presenting difficulties that might arise under any bonus system. It would seem that in the course of a year conditions would change sufficiently to equalize risks of injuries. As a matter of fact it is often found that more accidents happen in places that are supposedly safe than in those that are known to be dangerous. In this connection, attention is directed to the fact that certain companies have brought about great improvement by offering cash prizes to miners for gardens and clean premises.

The methods of securing co-operation of the miner are through the posting of warnings of different kinds, the printing of rules and regulations, the posting of newspaper accounts of mine accidents with illustrations showing how men are injured, the formation of inspection committees of miners, and through personal contact of the officials, captains and shift bosses. These methods are more or less productive of results, but there still exists a woeful lack of willing co-operation among the miners. Just how this condition may be improved is a problem, the solution of which will do much for the cause of safety in mines. Suggestions along these lines may be obtained through a study of the methods in use by many of the large industrial organizations of various parts of the United States.

The Efficiency Society will hold its September meeting at Lake Placid, N. Y., with a three-day conference on efficiency in non-profit-sharing establishments. Regular monthly meetings will be held in October, November and December.

Newton Cold Metal Sawing Machine

A 40-inch blade, high duty, cold metal sawing machine, adapted for steel foundry and chilled roll work, built by the Newton Machine Tool Works, Inc., Philadelphia, is shown

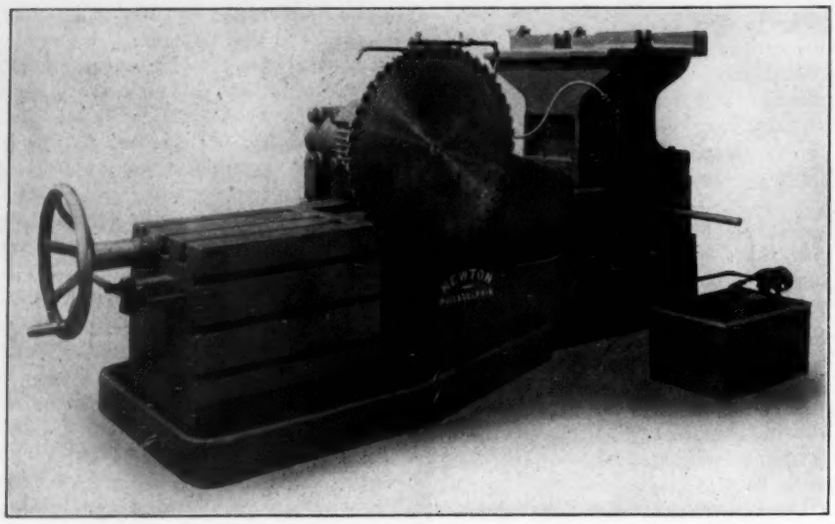


FIG. 1—OPERATING SIDE OF NEWTON COLD METAL SAWING MACHINE

in Figs. 1 and 2. The spindle, pinion shaft and all driving gears are of exceptionally large diameter and the gears are made of alloy steel with the exception of the large driving worm wheel, which is a solid bronze casting. The driving worm wheel is equipped with roller thrust bearings and the driving spline shaft is fitted with rotating auxiliary bearings to protect the stationary bushings from the key splines and also to prevent the escape of oil. The spindle reverses in cap bearings, is supported on both ends and the spindle saddle is of rigid box type construction with underlocking gibs cast solid. Vertical and horizontal adjustment is made by taper shoes and the saddle has a narrow guide bearing on the base to control alignment and to save power by preventing the binding of the saddle on the base.

Six changes of feed are available without the removal of gears and the power quick return can be tripped at any predetermined point and at both ends of the stroke in each direction. The entire base, including the work table, ways for the saddle and the extension on which the feed mechanism and the motor pads are mounted, is one solid casting. Around the entire casting is an oil pan cast integral with the base. The top surface of the main work table is provided with tee slots at right angles to the direction of traverse. The work table is 32 x 37 inches, while the vertical face of the main work table is provided with three tee slots.

Care in Construction

In the construction of the machine great care has been exercised to prevent the possibility of chatter and to eliminate this the feed screw has a bearing on both ends. For convenience in operation, the feed and fast power return can be controlled either at the front or rear of the machine, which is operated by a 23-horsepower motor running at 310 to 930 revolutions per minute. This motor is mounted on top of the bracket illustrated in Figs. 1 and 2, which is provided with adjusting screws, belt tighteners and power is transmitted to the machine from a 30-inch, 10½-inch face driving pulley. The auxiliary table has a top surface 36 inches square and a vertical clamping surface 24 inches deep.

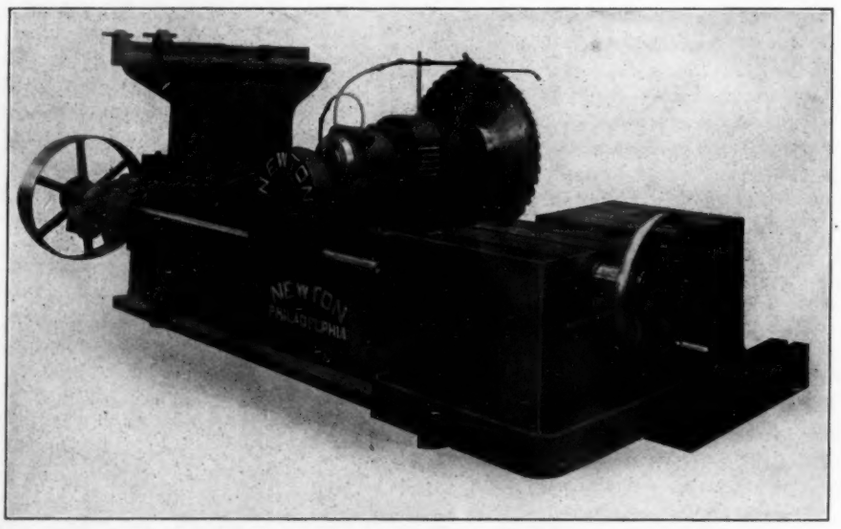
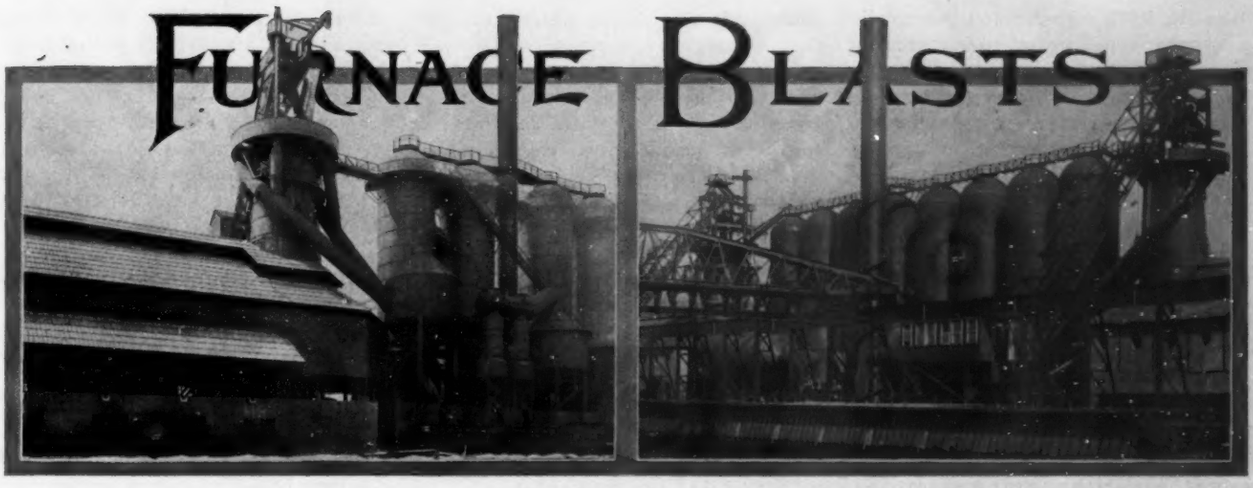


FIG. 2—DRIVING SIDE OF COLD METAL SAWING MACHINE



Developments in Lining Blast Furnaces

By C A Tupper

Thin lining for blast furnaces is a subject which has provoked considerable discussion among operators and engineers for more than a decade, but until recently without definite results. Those who have a practical interest in it may be divided roughly into two classes. One is represented by a leading operator who, in referring to the matter said: "I hear very little about thin linings any more; therefore, I would naturally suppose that the disadvantages offset the advantages, as the development is very slow." The other class, in limited but growing numbers, is keenly alive to the possibilities of thin or combination linings, and has been watching closely the results of their use at a number of centers of iron ore smelting.

The practice originated in Europe, where thin-lined, water-cooled furnaces have been in blast for some time, and of late years, it has gained a foothold in this country, having been tried out at several plants with varying degrees of success.

Advantages of the System

Referring to the advantages of the system, including water-cooling, the following statement made a year ago by John S. Unger, manager of the Central Research Laboratory maintained by the Carnegie Steel Co. at Duquesne, Pa., epitomizes certain features of it:

"Preservation of constant lines in the interior of a furnace," he said, "and the use of a lining of the proper thickness to maintain an economical heat balance, have shown a reduction in fuel, greater regularity of working and less variation in product" than under the older methods.

This statement, read at the Pittsburgh meeting of the American Iron and Steel Institute in October, 1912, is indicative of the practical concern now being shown in the subject. Correspondence with leading operators of the latter class above mentioned shows, nevertheless, that the majority is waiting to see what experience the pioneers in the new practice have, and to learn the type or types of construction, including methods of cooling, which show the best results. Hence publication of the facts obtainable at this time should be of decided interest.

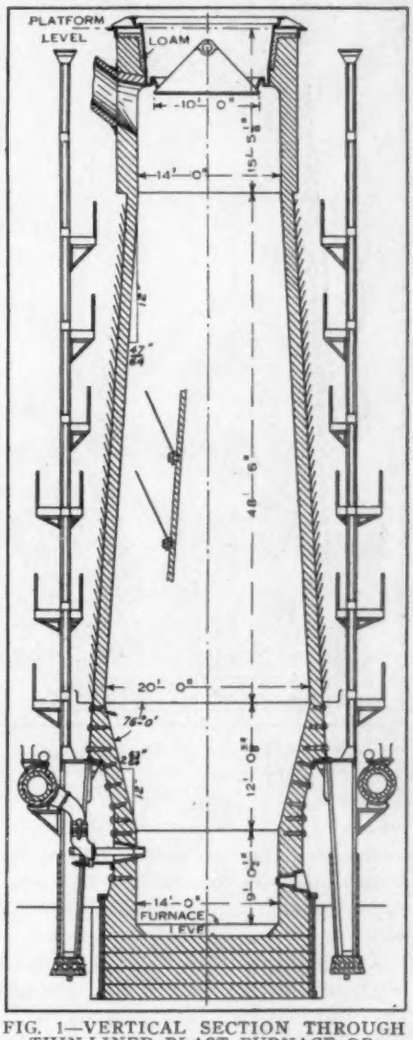


FIG. 1—VERTICAL SECTION THROUGH THIN-LINED BLAST FURNACE OPERATED BY THE EASTERN STEEL CO.

Progress made has been sufficient to demonstrate that the thin-lined furnace has not only proved a success, but is likely to be very generally adopted in the near future. Thus far five principal types of construction have been used in this country.

Bucket Type

The first of these is the so-called *bucket* type, which was originally installed at the Isabella-Lucy furnaces, Pittsburgh, and later at furnaces Nos. 6 and 5 of the Illinois Steel Co., South Chicago, in the order named, and Central D furnace of the American Steel & Wire Co., Cleveland. Some difficulty has been experienced in the use of this type of construction, due to the fact that the water is held against the furnace shell under a slight pressure, and the unequal expansion of the shell and buckets, or troughs, has in some cases caused leakage of the water into the furnace, with the resulting loss of the lining.

The reconstruction of No. 8 furnace at South Chicago, which was described in THE IRON TRADE REVIEW,

June 16, 1910, represented practically a second type, being constructed of cast steel plates. It was built after No. 6, above mentioned; but, as the older type was reverted to mainly in No. 5, rebuilt later, the design of No. 8 was evidently not the improvement that had been expected.

The third type of construction, as used on the thin-lined furnace No. 1 of the Tennessee Coal, Iron & Railroad Co., at Ensley, Ala., and on the thin-lined furnace of the Detroit Iron & Steel Co., Detroit, has a steel shell directly cooled by water sprays. No serious objection has been found to this type of construction, as the expansion and contraction of the shell cannot cause any bad results; and, even if the joints are somewhat loosened by this action, the water has no tendency to pass to the inside of the shell, being at no point under pressure.

Eastern Steel Co.'s Furnace

A fourth type is found in the new stack shown by Fig. 1, which is now being operated at Pottstown, Pa., by the Eastern Steel Co. This furnace, the details of which were given in THE IRON TRADE REVIEW, July 12, 1912, was especially built for thin lining, and the company mentioned states that "it is doing very good work and settling regularly with practically no off iron."

The entire framework, including the columns, is made of steel, and the top platform, charging apparatus, etc., are supported independently of the furnace shell by columns resting upon the main columns which support the furnace. The lower portions of the furnace columns are enclosed in cast iron casings filled with concrete. The inwall, 22-inch brick lining, is cooled by water carried and distributed by a spiral trough. The waste water from the tuyeres and bosh plates is delivered at different points in the spiral trough by an electrically-driven pump. This trough is connected to the furnace shell by tap bolts, thereby avoiding the possibility of water entering the furnace around the bolts. A washer is provided around each bolt and between the trough and the shell. As a result, there is an opening between the bottom of the spiral trough and the shell, which is continuous, except for the interference of the bolts.

At the lower end of the spiral trough the water is discharged into a horizontal trough, which in turn is connected to the drainage system. The construction and operation of the spiral trough is such that, while some of the water circulates around the spiral, a large quantity passes through the openings at the bottom to the courses of the spiral trough below and continues its flow to the horizontal trough at the lower end of the spiral. In passing from one course of the spiral to that underneath, the water is in immediate contact with the furnace shell, thereby forming a thin film over all of the plates. The effect of a well-distributed spray is thereby secured, with the additional advantages that the side of the spiral trough prevents the wind from interfering with the distribution of the water.

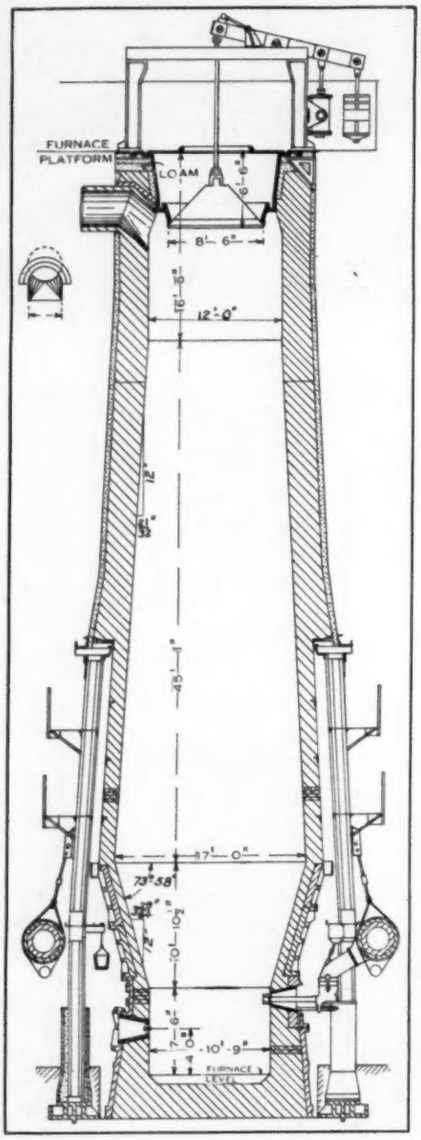


FIG. 2 — VERTICAL SECTION THROUGH PORT HENRY BLAST FURNACE SHOWING COMBINATION LINING

The bosh is enclosed entirely in a wrought steel casing having openings for the insertion of the bosh plates. The bosh plates are held securely in position by angles on the inside and outside of the steel casing, the former angles being above and the latter below the bosh plates. The steel casing enclosing the bosh extends downward to a point below the top of the hearth jacket and is provided with openings for the tuyeres. The hearth jacket is made of wrought steel plates which enclose a series of water-cooled cast iron plates. The furnace mantle is simple in construction and a continuous wrought iron casing is provided which extends from the top of the hearth jacket to the top of the furnace.

Combination Lining

The idea of a *combination,* or thick and thin lining has been worked out along somewhat novel lines, in what may be termed a fifth type, at the plant of the Northern Iron Co., Port Henry, N. Y. In a new furnace which was blown-in there, not long ago, shown by Fig. 2, the thin lining is used for the bosh and to a height of 18½ feet above the bosh line, the remainder of the inwall having a lining more than twice as thick. The mantle ring is placed at the point where the thick lining begins and is supported there by the usual set of columns. The steel shell enclosing the thin portion of the inwall is riveted to the mantle and extends downward to a point slightly below the bosh line. At this point a water trough is riveted to the shell and between the mantle and the top of the bosh jacket the furnace is cooled by water sprays. The bosh and hearth jackets are constructed of heavy cast iron sections, which contain cooling coils, each having a separate connection. No water-cooling is provided for the thick-lined in-wall above the mantle, but cast iron water-cooled plates protect the inside of the mantle itself.

The theory of the combination lining is that it is more advantageous to use a thin lining for the *working* portion of furnace, which may become unduly hot, and to retain the heat, by means of a thick lining, in the upper portion of the stack where the stock is in course of preparation. This type of construction was tried out in a stack at Standish, N. Y., and in an older furnace which the one above described, replaces. The latter, as a basis for future practice, was remodeled to embody the features that have been more fully carried out in the new stack. In general, however, it may be said that the use of a cast iron shell encasing the bosh and lower inwall of a furnace, with cooling pipes cast in these plates, is open to criticism, owing to the difficulty of securing structural strength equal to what

would ordinarily be found necessary. In cases where successfully used, local conditions have probably been favorable.

Ensley Stack

The thin-lined furnace at Ensley, No. 1, is similar in construction to the other thin-lined furnaces described above, in that it has steel columns extending from the mantle plate to the top of the furnace and supporting the bridge and top structure, while inside of these columns and made integral with the mantle plate is the riveted steel plate shell having spray pipes so arranged as to keep a constant flow of water over its entire surface. This water is caught in a shell trough near the mantle plate and is carried away without any point having more than a film of moisture in contact with the shell except in the water box which is provided with a sufficient number of openings to lead the water away without permitting it to reach an appreciable depth in the trough.

After this furnace was finished, it was found that, when there was any appreciable amount of wind, the water was carried from the surface of the shell and distributed and blown in spray over the surrounding territory; and in order to overcome this difficulty it was found necessary to place a sheet iron casing inside of the column construction to keep the wind from reaching the water film. The operators of this furnace state that it has been in successful operation for more than three years, or since July, 1910, "and is still in condition." No changes have been made in the final plan.

A more substantial type of construction would, however, be necessary in the north and some method of heating probably required to prevent the freezing of the water spray on the inside of this protecting case.

Detroit Thin-Lined Furnace

These difficulties have been satisfactorily worked out in the thin-lined furnace of the Detroit Iron & Steel Co., which is the only furnace in this country that has been converted from thick-lined to thin-lined construction. In this furnace, the original furnace shell, skip hoist and top were maintained intact, and a new steel plate shell and mantle plate were constructed inside of the old furnace shell, as shown in Fig. 3. This inner shell is made of ¾-inch plate throughout, and the mantle plate rests on brackets securely riveted to the furnace columns. The cooling is effected by water sprays, and the water is collected in a trough immediately below the old mantle plate. This trough is provided with a sufficient number of outlets so that the water does not at any point reach a depth of more than two inches, with the result that at no place is there a tendency for the water used in cooling to penetrate the furnace shell and damage the lining. Immediately below the water trough, holes are cut through the new shell for the insertion of copper bosh plates, the shell being amply reinforced between these openings so as to provide sufficient strength. Below the new mantle plate, there is standard copper-plate-cooled bosh construction.

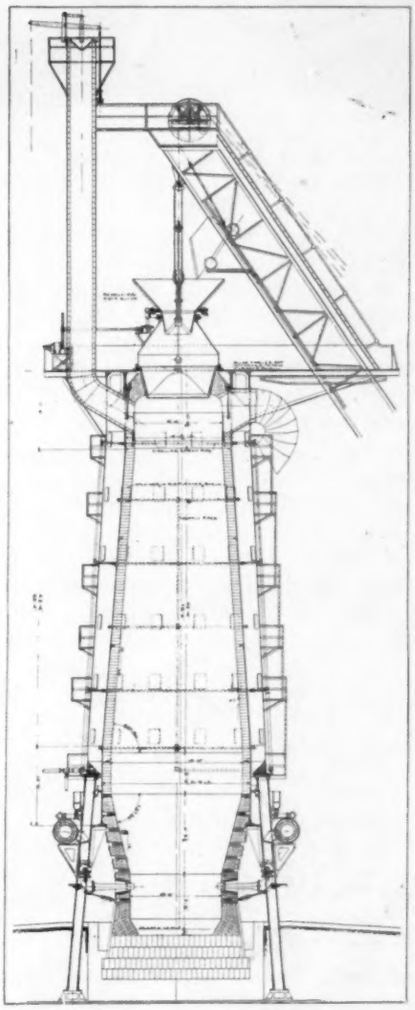


FIG. 3—VERTICAL SECTION OF THIN-LINED FURNACE OPERATED BY THE DETROIT IRON & STEEL CO.

The inner shell supports the distributor and its top, and is kept from warping out of plumb by guides which are provided in connection with the outer shell and in contact at numerous points around the top of the inner shell. These guides permit of free movement of the inner shell vertically to allow for expansion, but prevent lateral movement. The downcomers are directly connected to the inner shell, thus providing a tight joint between the inner shell and downcomers, and expansion is permitted by the openings in the outer shell, which are somewhat larger than the downcomer pipes. By this construction the hoist bridge, furnace top and distributor are maintained in the proper relation to each other, while unnecessary strains are avoided by allowing free vertical movement such as may be made necessary by the expansion of the inner shell.

The entire inwall lining, 12 inches thick, is constructed of 6 x 12-inch key brick, supported on the inside by three angle iron rings.

In the bosh walls there are eight rows of bronze cooling plates, two of these rows being set above the mantle plate of the inner shell.

The bosh lining is composed of 9 and 13½-inch brick and approximately 2 feet thick. In the hearth the usual construction has been followed. The diametrical dimensions of the bosh and hearth are increased proportionately to that of the stack.

Increase in Production

The cost of renewing the inwall lining averages 30 per cent or less of the former expense for the thick-lined furnace, including tearing down the old brickwork, and it can be done in about one-quarter the time formerly required. This stack has produced fully 25 per cent more iron than was possible before the thin-lining was installed, for the two-fold reason that in rebuilding it was possible to make the diameter of the bosh of the furnace one foot greater than was practicable with thick lining without changing the old shell, the diameters of the hearth and stock line being increased proportionately. This enlarged size is responsible for part of the gain in production, but the absolutely uniform operation, with freedom from slips and resultant off-iron, have also been material factors in the further increase, thus justifying the statement and prophecy of Mr. Unger, previously quoted. In the preparation of this and succeeding articles the writer has communicated with all of the blast furnace operators in the country, and finds that water-cooling, thin lining and resultant factors are among the subjects uppermost in their minds at present, so that further developments of interest may be looked for in the near future.

How to Prevent Blindness Among Your Employes

Safety Goggles Worn by Chippers and Floggers Save Eyesight—Prejudice Against Them Can Be Overcome—Results at Plants of American Steel Foundries

It has been estimated that probably 50 per cent of the accidents in steel foundries affect the eyes of workmen. While proper lighting is the first essential in the conservation of eyesight, nevertheless there are other dangers, such as the careless use of emery wheels, flying metal chips, burns and other comparatively preventable accidents. In a recent issue of the *Monthly Bulletin* of the American Iron and Steel Institute, William H. Cameron, manager of the casualty and safety departments of the American Steel Foundries, Chicago, discussed the "Saving of Eyes in the Steel Industry," in part as follows:

GOGGLES THAT SAVED THE EYE OF A CHIPPER

"Competent authorities estimate that there are in the United States between 20,000 and 30,000 cases of blindness from preventable causes, and that there are several million people in the country who do not reach their maximum output by reason of defective vision. The suffering and economic loss due to defective eyesight is enormous.

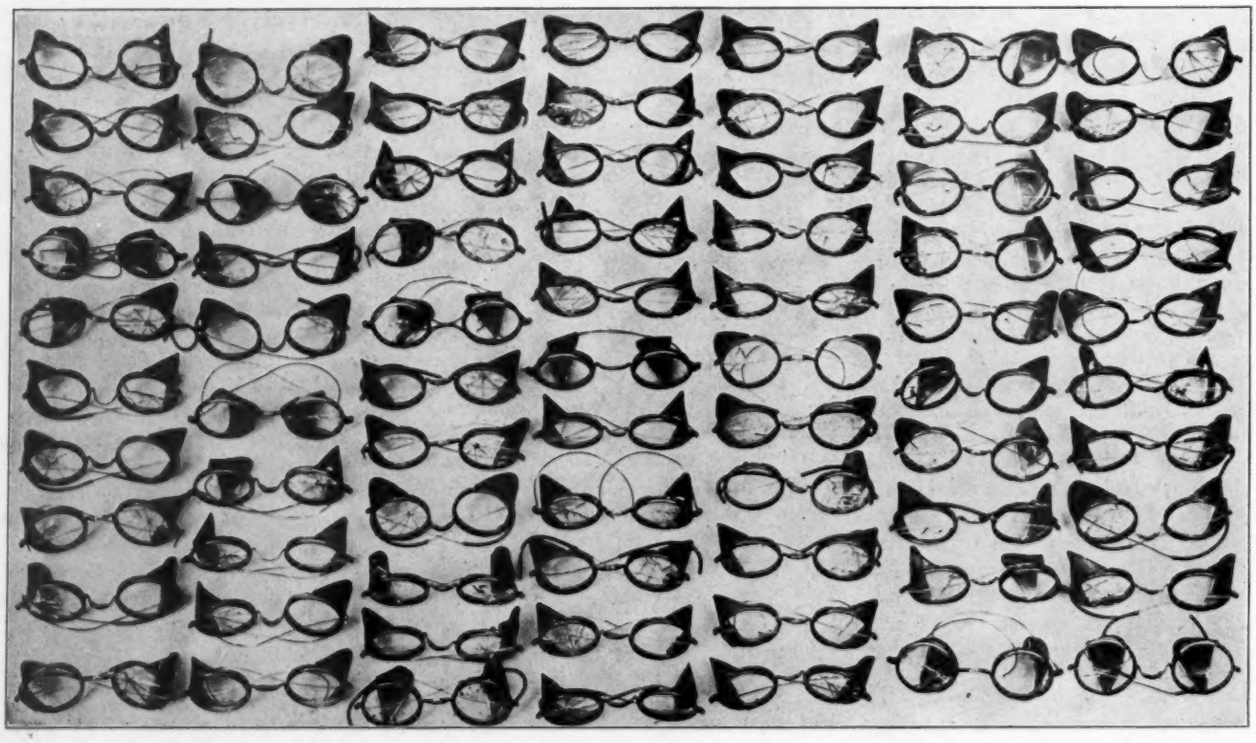
"It is well known that a multitude of afflictions can be traced to visual disabilities, and it has been suggested that the dyspeptic philosophy of Thomas Carlyle might have been tempered by a pair of spectacles.

"The railroads have found it necessary to examine the eyesight of their workmen, for the reason that it is essential to the safety of the public and the continuance of the business of the roads that the operatives be able without fail to distinguish colors and objects. An awakening of other employers on the general question of efficiency among workmen will lead to similar examinations for determining the applicant's physical fitness for his work.

"Much work of great social value and of no small importance can be done by intelligent examination of the general optical conditions under which men work, and by the examination of all workmen for defective vision and diseases of the eye, and the refusal to employ men whose vision is defective.

"A man who does not see well at his work runs exceptional risk of accident to himself and his fellow employes. He also works at a considerably diminished efficiency. It is, therefore, to the best interests of all concerned that workmen should not be permitted to work at hazardous occupations if they have poor or defective eyesight.

"While it is believed that the employer cannot, and should not, be held responsible for inherent or constitutional defects, it is his duty to pre-

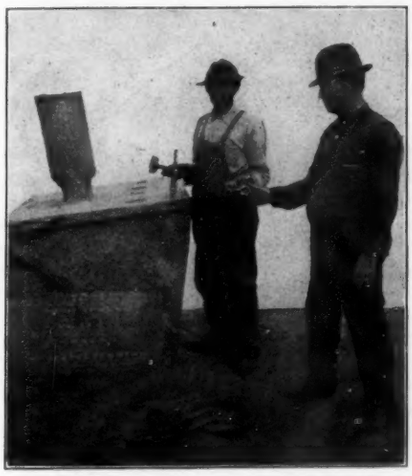


THESE GOGGLES WERE BROKEN BY FLYING STEEL CHIPS IN THE PLANTS OF THE AMERICAN STEEL FOUNDRIES AND WERE THE MEANS OF SAVING THE EYES OF MANY WORKMEN

vent, as far as possible, accidents to the eyes of employes. The foundry industry is a hazardous occupation, but even in the foundry industry a large percentage of accidents is preventable.

"Proper lighting is the first essential in the conservation of eyesight. But there are other and greater dangers than improper lighting, such as those from flying particles of steel, ore, or emery, those from acids or other chemicals, and those from other irritating substances which either directly destroy the eyesight or cause such inflammation that the vision is greatly impaired.

"Injuries from small flying particles may be either slight or serious; and injuries which are apparently slight may develop into serious cases unless properly taken care of. Sometimes small particles puncture the walls of the eyeball. Unless removed, they endanger not only the eye affected, but both



A MAN WITH TWO GOOD EYES IS EMPLOYED AS A FOUNDRY CHIPPER AND THE FOREMAN HANDS HIM A PAIR OF GOGGLES

eyes, by causing sympathetic inflammation of the uninjured eye. In other cases infection gives rise to dangerous ulcers which may partially or wholly destroy the eyesight, and in some cases even the eyeball.

"There are two general sources of danger to the eyes: First, those originating with the workman himself; second, those originating with other workmen. Protection from the first is obtained mainly by the wearing of suitable goggles. Protection from the second may be had by the use of screens and by giving proper instruments to workmen. That the need for such precaution is great has been proved by the experience obtained in the plants of one steel company which showed that 250 men had lost their eyesight through simply permitting other workmen to remove foreign bodies from their eyes. The loss of sight in such cases is caused by the perforation of the cornea, or by the transmission of infection by finger nails and other means, producing corneal ulcers which leave scars. The experience of this one company indicates that workmen should be instructed not to allow anyone but a doctor to remove irritants from the eye.

HE CANNOT UNDERSTAND THE REASON FOR WEARING THE SAFETY GOGGLES AND FASTENS THEM TO HIS HAT

Two Factors in the Problem

"There are two factors to the spectacle problem: First, securing suitable spectacles; second, getting them worn. By reason of its fragile and imperfect construction, the ordinary goggle or spectacle usually provided for workmen offers little if any protection. Indeed it frequently causes the loss of an eye by the fracture of its brittle lenses. The lenses must, as the prime consideration, be clear and transparent. And they must be strong enough to withstand a heavy blow from a blunt instrument. Another important consideration is the weight of the spectacles. They must be as light as it is possible to make them consistent with safety.

"Diseases such as trachoma, iritis, etc., are transmitted by the promiscuous use of spectacles. Spectacles should always be thoroughly clean. By boiling them in hot water or immersing them in an antiseptic solution, they can be put in a sanitary condition, and this precaution should always be taken. Where spectacles are handed in with the workmen's tools, they should be cleaned daily. They can be kept clean while in use by rubbing the lenses with an anti-sweat pencil (made principally of paraffine) and afterwards polishing with a cloth cleaner. This will keep the glasses free from moisture from three to five hours.

UNFORTUNATELY, HE SOON IS FORCIBLY MADE TO SEE THE ERROR OF HIS WAYS

AND NOW HE IS A MEMBER OF THE HALF-BLIND FAMILY

"There are many classes of workmen who should always wear spectacles while at work. Among these are chippers and floggers in steel foundries. The work should be so arranged that the chips will fly against a wall or a screen covered with canvas, burlap or fine wire net. There is special danger to ladlemen and helpers in foundry work from sparks and splashes of molten metal while it is being poured into molds. Blacksmiths, machinists and workers about forges and fires are also liable to eye injuries from flying sparks and should wear eye protectors.

"Cheap hammers and chisels of poor quality are frequently the cause of eye accidents to mechanics. Care should be taken in all shops to have such tools carefully inspected each day and the burrs on the chisel heads ground off to prevent them from flying off and

striking the user of the tool or a fellow-workman. Blasting in mines and quarries causes a large number of accidental injuries. These accidents are liable to destroy both eyes of the workman and make him a burden upon the community for life.

"Glasses are recommended to be worn by operators of open-hearth and crucible furnaces, as well as by workmen handling molten babbitt metal. Explosions have been known to scatter this metal, some of it going into the eyes of the workmen.

"Men employed about electric arc welders should always wear a helmet to cover the head and protect the eyesight and skin. These helmets are made of aluminum or tin and are so light in weight that the men are willing to wear them. There is an opening in the helmet to see through. This opening is covered by a set of four glasses, two red and two blue, arranged in the order of one blue and one red. This arrangement provides a quadruple protection against the intense rays of light. The arc welders' room should be isolated. As there is generally no roof to this room, men working on machinery, such as cranes, which pass over this room may have their eyes affected in the same manner as a welder. Their eyes should be protected by a helmet.

"Workmen who have errors of refraction or loss of accommodation, should have special lenses made and fitted to the safety spectacles to improve their sight, and at the same time make the wearing of the spectacles comfortable.

"To promote eye-safety the workman must be educated to the necessity of wearing spectacles. Objections will sometimes be made to any such protection on the ground that it interferes with ease in working. If a safety inspector gives all his time to the education of the men for at least two or three months, a sufficient number of accidents will have been avoided to demonstrate to all the workmen the absolute necessity of this protection.

Striking Illustration

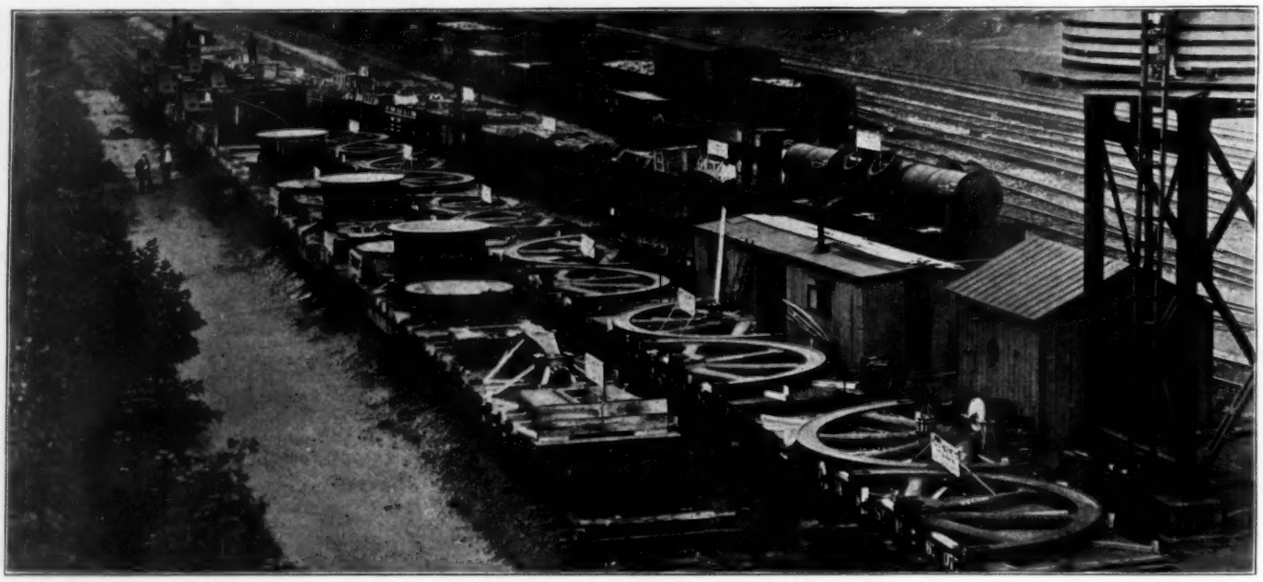
"In one large steel foundry where spectacles have been in use for about two years, 48 pairs were collected in one month with lenses broken by flying pieces of steel, and 297 pairs have been collected among the several foundries of the company over a period of six months. During this period there were no serious eye accidents in these plants.

"When a workman realizes that he cannot secure a job in the dangerous trades if he refuses to wear safety spectacles, or retain his place if he neglects to wear them, the habit of wearing them will soon become fixed, to the great benefit of both employer and employed."

The goggles shown at the beginning of this article were made by the Julius King Optical Co., New York City. One lens was broken by a flying chip of steel which struck the glass instead of the eye. While the steel penetrated the glass, the chip did not come in contact with the eye. The glass in these goggles is absolutely transparent and is strong and tough. While flying particles of iron or steel may fracture the glass, it holds together and seldom shatters. The frames are made entirely of white metal and will not corrode. As cleanliness about the eyes is essential these goggles can be sterilized.

Large Blowing Engine Shipment

The Mesta Machine Co., Pittsburgh, has just completed a shipment of three large blast furnace blowing engines, built for the Broken Hill Proprietary Co., Ltd., Melbourne, Australia. The engines are of the vertical high speed type and will be used to furnish the blast for the new plant that is being erected at Melbourne and which will make the first pig iron produced in Australia. Two of the engines are for high pressure steam with 44-inch steam cylinders, 60-inch stroke and 84-inch air cylinders. The other engine is for low pressure steam with an 84-inch steam cylinder, 60-inch stroke and an 84-inch air cylinder. All air heads are equipped with Mesta valves. As shown in the accompanying illustration, 23 cars were required to carry this shipment to the seaboard, the total weight having been 1,300,000 pounds. The Pennsylvania railroad made up this shipment as a solid train, having transported the cars in 24 hours from the time they left the yards at Pitcairn, Pa. From New York the engines will be shipped by the American-Australian line to Australia, the total distance being about 8,000 miles and about 70 days will be required to make the journey.



THREE LARGE BLOWING ENGINES FOR SHIPMENT TO AUSTRALIA, ON CARS AT THE MESTA MACHINE CO., PITTSBURGH

The eighteenth edition of the "Manual for Engineers", compiled by Charles E. Ferris, professor of mechanical engineering, published by the University of Tennessee, Knoxville, Tenn., in addition to engineering tables contains considerable new information including instructions to be followed in case of electric shock, injuries, antidotes for poisons, etc.

Furnaces Show Interest in Next Year's Needs

Massillon Pipe Company Sounds the Market—Strike at Head of Lakes Reduces Ore Shipments—Considerable Irregularity in Prices of Finished Products

BY GEORGE SMART

Pig iron consumers are showing more interest in their requirements for next year. Some additional inquiries have been received in eastern territory, including that of a Connecticut buyer, who asked for 2,000 tons of foundry iron for February delivery. A Massillon manufacturer of cast iron pipe is inquiring for 7,500 tons of Nos. 3 and 4 and gray forge for delivery during the first half of next year. Furnaces are expected to quote from 25 to 50 cents advance on business for delivery after Jan. 1, but they are not anxious to quote. The General Electric Co. has closed for at least a part of the tonnage for which it was inquiring last week, amounting to 11,500 tons. The business awarded was principally for Schenectady and New England plants. Buffalo makers received most of the Schenectady business at about $14, that city. A Providence company is understood to have placed 1,000 tons of foundry iron for delivery in the first quarter of next year at a slight advance over the lowest prevailing price. The sales in the south aggregate 25,000 tons in scattering lots for delivery from 30 to 90 days. The $11 price is minimum and one large company has advanced its quotation to $11.50. There is a good demand for pig iron in the Philadelphia district, where the sales include 4,000 tons of No. 2X to the Baldwin Locomotive Works at about $15.25, delivered. Pipe foundries are active in Philadelphia market. The Steel Corporation is still figuring on a round tonnage, but steel-making irons are extremely dull.

Iron Ore

The effect of the strike at the Allouez dock, at the head of the Lakes, is reflected in the figures of ore shipments for August. The shipments were 7,677,601 tons, a decrease of 82,647 tons, compared with August, 1912, and a decrease of 526,815 tons, compared with July, 1913. The loss at the Allouez dock was almost a million tons. Except for this, the August movement would have exceeded that for July.

Coke

Some weakness is reported in standard Connellsville furnace coke in eastern territory, where a leading buyer took several thousand tons for quick shipment at $2.30, ovens, while there are reports of $2.35 and $2.45 being offered. In spite of these reports of weakness in the east, buyers in the central west are unable to shade the $2.50 price, which has been maintained for a number of weeks. At Pittsburgh an interest outside of that district bought 25,000 tons a month for shipment the remainder of the year at $2.50, ovens, and many August contracts have been renewed for shipment this month. About 25,000 tons of Hostetter-Connellsville coke, which is controlled by the Steel Corporation, will figure in this month's shipments.

Bars

There are some reports of shading on extras on steel bars, but the base price is firmly adhered to. Bar iron is extremely weak and some mills are selling as low as 1.30c at their plants. It is doubtful whether this quotation covers the cost.

Crude Steel

At least two of the important makers have reduced contracts taken earlier in the year to $26 for sheet bars and $25 for billets at mill. Sales have been made by small mills at less than these prices. A Richmond buyer has closed for 3,000 tons of axle billets.

Structural Material

Contracts for a considerable tonnage of bridge material for the replacing of structures washed out by last spring's flood are expected to come into the market soon. Structural lettings of the week are not large. Kresge's building, Detroit, calling for 2,000 tons, was awarded to the American Bridge Co.

Railroad Buying

There are indications that leading railroads will soon adopt a more liberal buying policy and will place many orders which have been held up for a long time. At present, however, the buying is light. The Maine Central bridge at Augusta, 2,500 tons, has been awarded to the Phoenix Bridge Co.

Finished Material

Reports of different companies vary as to business in finished materials for August, compared with July. Those of the Steel Corporation companies are, almost without exception, optimistic, stating that there was a large volume of specifications and good aggregate of small orders. Some of the independent companies, however, are getting to the point where new tonnage on books is extremely desirable. Consequently, there is a tendency toward reducing prices. On plates and shapes, the larger companies are holding to 1.45c, Pittsburgh, but 1.40c is rather freely made on desirable business. On nuts, bolts and rivets there is considerable unsteadiness, and it is difficult to quote prices with any degree of accuracy. Wire products are weak and some cutting of the recent new quotations is reported.

Heavier Specifications at Pittsburgh

But There is Very Little New Business and the Tendency to Revise Quotations on Finished Materials is More Pronounced

BY C. F. WILLIAMS

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, Sept. 2.

August specifications against contracts were considerably heavier than those received in July, several leading mills advise, and shipments continued at about the rate which has prevailed since the early part of the year. Exceedingly little new buying has been done this year and with comparatively few exceptions the end of the tonnage for future delivery is in sight. The tendency toward a readjustment in prices of semi-finished and finished steel products, first noticeable several weeks ago, appears to be more marked and actual reductions have been made in some instances.

Pig Iron. — The average price of Bessemer and basic pig iron in August was $15.657 and $14.045, respectively, at valley furnace, figures compiled by W. P. Snyder & Co., indicate. Compared with July averages, Bessemer advanced 25 cents and basic declined 18 cents. The Bessemer average for August is $1.123 and the basic average $0.045 above averages established in the corresponding month a year ago. Sales last month involved about 29,800 tons of Bessemer and 21,500 tons of basic. The United States Steel Corporation continues to figure on a round tonnage of Bessemer pig iron, and the McConway & Torley Co. is negotiating for about 1,200 tons for the remainder of the year. The market is quiet, but there is a tendency toward higher prices, some dealers refusing to sell Bessemer at less than $16, and foundry malleable and basic at less than $14.25, valley, but consumers regard the price of basic with suspicion, expressing a belief that it is obtainable at $14.

Ferro-Alloys.—The market is quiet, although some believe prevailing prices of ferro-manganese can be shaded. Ferro-silicon continues to be held at $75, Pittsburgh, at which figure it has been quoted all year.

Sheets.—Consumers are covering future needs earlier than usual, but not enough buying has taken place to benefit prices. The American Sheet & Tin Plate Co. has received an order for 5,000 tons of sheets from a maker of automobile parts. Mills are operating at about the same rate as last week. The bottom of the market for black and galvanized sheets appears to be 2.15c and 3.20c, for No. 28 gage, respectively.

Plates and Shapes.—The larger mills continue to hold plates and shapes at 1.45c, but nearly all the smaller interests have sold plates at $1 a ton less than that figure, as has been indicated in previous reports. Shapes, however, are firmly held in this district. No large inquiries are pending, and rather quick plate deliveries can be had.

Rails and Track Material.— There has been some supplemental buying of standard rails for this year's delivery, and demand for light rails continues satisfactory. Because of delayed deliveries this year, it is probable leading railways will cover 1914 needs earlier than usual. Spikes are quiet, and some makers are refusing to shade 1.7c for standard sizes. Other track fastenings are firm at current prices.

Billets and Sheet Bars.—At least two of the more important makers have reduced contracts, taken earlier in the year, to a basis of $26 for sheet bars and $25 for billets, at mill. A couple of small mills, not usually figuring as factors in the market, have sold open-hearth sheet bars at less than the above figure. New capacity has tended to reduce prices, but leading makers are refusing to offer material at any less than $26, mill, for sheet bars.

Hoops and Bands.—Liberal buying of steel hoops at 1.60c removes any doubt regarding the price of this product, and bands continue firm at 1.40c.

Iron and Steel Bars.—Steel bar manufacturers enjoyed a fairly heavy buying movement last month, as a result of activity on the part of agricultural implement makers, nut and bolt manufacturers and shafting interests in covering fourth quarter needs. Iron bars have been in good demand, but are not commanding the high prices ruling early in the year. Cold rolled shafting is being held at 60 and 62 per cent off for carload lots.

Iron and Steel Pipe.—Demand for lap weld material continues brisk and in the aggregate mills have booked rather heavy tonnages this week. Several interesting inquiries are pending. Discounts are well maintained.

Muck Bar.—The Youngstown Sheet & Tube Co., A. M. Byers & Co., the Kittanning Iron & Steel Mfg. Co., the Wheeling Steel & Iron Co., and several other large mills have not yet signed the scale asked by United Sons of Vulcan. Muck bar is nominally quoted at $31, Pittsburgh.

Nuts, Bolts and Rivets.—Conditions remain unchanged, and reports are heard that rivets are obtainable $2 a ton less than the prevailing prices. Heavy buyers of nuts and bolts have no difficulty in shading current discounts.

Boiler Tubes.—Specifying continues heavy and mills have booked additional orders this week. Prevailing discounts are firmly held.

Tin Plate.—No large orders have been taken since that of the Standard Oil Co., which bought 100,000 boxes from the leading interest 10 days ago for re-export trade. Consumers are not expected to cover next year's needs for a month or six weeks.

Wire.—Reports of price shading appear to be without foundation. Some of the most cautious buyers in the country last week placed contracts at prevailing prices. The market is firmer than it has been at any time since the early part of the year.

Wire Rods.—The bulk of the tonnage is selling at $27.50, Pittsburgh, and $28 has been obtained on a number of small lots. Inquiries have not been large enough to test the market. We quote Bessemer and open-hearth wire rods at $27.50 to $28, Pittsburgh.

Coke.—Standard Connellsville blast furnace coke is held at $2.50, ovens, although some grades are obtainable at $2.25, ovens. An interest outside this district last week bought 25,000 tons a month for shipment the remainder of the year at $2.50, ovens, and several operators advise they have renewed practically every August contract for shipment this month. Several consumers have not yet covered September needs, and declare they will not pay $2.50. About 25,000 tons of Hostetter-Connellsville coke will figure in this month's shipments. This fuel, controlled by the Corporation, does not usually find its way to the market, although a similar tonnage was sold last month. The Connellsville *Courier* for the week ending Aug. 23, says output was 369,476 tons, a decrease of about 25,000 tons compared with the week before.

Old Material.—Better conditions are reported at Philadelphia and New York, but the local market has failed to reflect any strength, and some dealers do not hope to witness improvement until after the readjustment in finished lines progresses further. An abundance of scrap is being offered, but consumers are not anxious to cover future needs.

Slight Revival in Chicago Pig Iron

With Considerable Quiet Buying—Some Companies Fared Better Than Others Last Month in Finished Lines

BY H. COLE ESTEP

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, Sept. 2.

September finds the iron and steel trade in the west in a somewhat spotted condition. During the last two weeks in August, there was an increase in new business which does not seem to have been entirely sustained. Some producers report that their August sales were in excess of July, while others, among them the leading interest, advise that July was the better month of the two. Prices have been very well maintained, all things considered, and the steel market cannot be quoted any lower than it was a month ago. It is true that there has been some shading on plates, but this has not been sufficiently extensive to affect general conditions.

Pig Iron.—There has been a slight revival in the Chicago pig iron market and considerable quiet buying is reported. The Emerson-Brantingham Co. has purchased about 2,500 tons for its Rockford plant including off-grade northern and some southern iron. A Kalamazoo manufacturer has bought about 500 tons of southern iron for shipment during the rest of the year, and a local foundry has purchased 300 tons of southern No. 2 on which shipments are to commence at once. As far as Chicago territory is concerned, southern iron is fixed at $11, Birmingham, for No. 2. Prices are in general well maintained and the local furnaces have booked sufficient business so that they are no longer uneasy. The extremely low prices on charcoal iron are somewhat less in evidence.

Merchant Bars.—Bar iron specifications show practically no diminution, but on account of a lack of railroad orders the mills are making concessions on new business. Some sales have been made recently at 1.40c, Chicago. Although the demand for reinforcing material is light, the price of rerolled steel bars is being fairly well maintained. There have been no new developments in the soft steel bar situation and current business is being taken at the full price; specifications are fairly satisfactory and most of the mills have enough orders to run for about 60 days. Shafting appears to be a little stronger.

Plates and Structurals.—Car builders did not specify as heavily last month for either plates or shapes, nevertheless the mills have been able to keep running at practically their full capacity. The Illinois Steel Co. has sufficient orders for the year. On account of the competition now prevailing, none of the makers are allowing the business which they have on their books to stand in the way of early shipments to their regular customers. The price situation is fairly stable. A prominent fabricator reports that about two weeks ago he was able to obtain a tonnage of plates and a couple of carloads of shapes at 1.40c, Pittsburgh, but he finds that this figure cannot be duplicated at present. On the other hand, there is some evidence of weakness in sheared plates, and it is probable that an inquisitive buyer could shade the official quotation $1 a ton.

Rails and Track Fastenings.—The movement of light rails is fairly satisfactory, but prices are under pressure due to competition from the re-rolling mills. There is practically no activity in standard rails, although a number of western lines have their requirements under advisement. It is probable that before the month has closed some important contracts will be made. The demand for track fastenings is fair and prices for the time being are well maintained.

Bolts, Nuts and Rivets.—Unsteadiness continues in the bolt, nut and rivet trade, due, as has been pointed out in previous reports, to an excess capacity in this district. The recent heavy contracting by the agricultural implement makers served to steady the market for a while, but this influence has now been removed. Orders show a slight increase and the makers are hoping that September will show up better than August.

Sheets.—In the face of a fair demand, sheet prices continue irregular. Western makers attribute this condition to a weakness existing in the Pittsburgh sheet bar market. For mill shipment, the Chicago market is quotable at 3.38c for No. 28 galvanized, but $1 a ton less would be accepted on desirable business. Black sheets are quotable at 2.33c, Chicago, for prompt mill shipment. Store prices are unchanged.

Wire Products.—Increased orders are reported in the west at the market prices which are now ruling. Agricultural conditions in the northwest are exceptionally good and the wire makers are less uneasy over prospects for fencing, barb wire, etc. Owing to irregularities in prices, August did not compare favorably with July in the amount of business booked.

Cast Iron Pipe.—There is very little activity in cast iron pipe at present. Business is confined to small lots and concessions are being made. Money conditions are reported easier and it is hoped by the pipe makers that this will have a favorable effect upon municipal bonds.

Merchant Pipe and Tubes.—Business in merchant pipe and tubes is fairly satisfactory and the prevailing discounts are being well maintained. The tube market seems to be in a healthier shape than the pipe trade. Recent statistics show a serious falling off in building construction in Chicago this summer compared with 1912. This has naturally had an effect on the outlet for iron and steel pipe. The stocks in the hands of local jobbers are fairly complete.

Old Material.—There have been practically no interesting developments in the scrap market. Unsteadiness in bar iron makes many consumers wary and the steel makers seem to be well supplied with melting stock at present. A strike in one of the local re-rolling mills has also curtailed the demand. Prices in general have not changed during the past 10 days. Turnings are a little firmer and are now quoted at from $5 to $5.50, Chicago.

Answers Rate Complaint

The Erie Railroad Co., et al., have filed a brief with the Interstate Commerce Commission in reply to the petition of the Kittoe Boiler & Tank Co., asking for reparation growing out of a shipment of 14 cars of riveted steel pipe from Canton, O., to New York City (or Jersey City).

The complaint said the rate of 21 cents per 100 pounds which was assessed, was unlawful and should have been 13½ cents, the rate which is applicable to bridge iron or steel. The pipe was for the piers of a foreign bridge, and it was claimed the material should take the export rate for bridge material and not the domestic rate for riveted steel pipe.

The defendants reply that the complainants failed to show this material was for a bridge, or that the material was exported, and that the 21-cent rate is applicable to riveted steel pipe exceeding 48 inches in diameter, whether intended for export or not.

Inquiry for Pig Iron for Next Year

Received at Cleveland From Massillon Melter—Leading Interest Reports Good Business in Finished Materials

BY GEORGE SMART

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, Sept. 2.

Iron Ore.—Owing to the double holiday of Sunday and Monday, there is considerable congestion at upper and lower lake docks, and it will probably be Thursday night or Friday morning before normal conditions prevail at Lake Erie ports. A considerable fleet was held at Lake Erie ports from Saturday until Tuesday morning, waiting for coal cargoes.

Pig Iron.—The most important inquiry for pig iron for next year's delivery which has appeared in the Cleveland district has just been sent out by the Massillon Iron & Steel Co. It asks for 7,500 tons for delivery during the first half of 1914, as follows: 4,500 tons No. 3; silicon, 1.75 and over. 1,500 tons No. 4, silicon, 1.50 and over; 1,500 tons gray forge, silicon, 1.25 and over.

Aside from the Massillon inquiry, there has not been much new business and the furnaces are slow to quote for delivery after Jan. 1. They will probably ask an advance of 25 cents. All consumers of pig iron are taking the deliveries as fast as they can get them and furnaces are having considerable difficulty in keeping them satisfied. This is particularly true of melters of basic.

Coke.—Cleveland furnace interests are still hopeful of shading the $2.50 price which has prevailed for a number of weeks, but have not yet been able to do so. There is much complaint concerning scarcity of box cars for hauling foundry coke, which is due, in part, to the fact that not so many box cars are being made as in past years.

Finished Material.—Last week was one of the very best for a long time for the Carnegie Steel Co., which reports a very encouraging volume of small orders. The demand for light rails is especially good, the warehouse business for August exceeding that for July. Some of the independent companies have not found business so good. They report that specifications are light. An inquiry is pending for 500 tons of 80-pound rails. New business in bridge material amounting to between $5,000 and $10,000 is in sight. This new bridge work is due largely to the floods of last spring. Indications show that the railroads, particularly the Lake Shore, are about to adopt a more liberal policy in buying, and will place some business which has been held up for months. Bar iron is inactive and weak. It is understood that Indiana mills are making as low as 1.35c at their plants. Cleveland iron mills continue in operation with barely enough orders to keep them busy. Irregularity in sheet prices continues. A Cleveland firm is figuring on the New Haven, Conn., postoffice, calling for 1,000 tons of steel.

Old Materials.—Sentiment has been gradually improving in the old materials market in this district, but business has continued dull. Dealers generally seem to feel that a period of better prices is at hand, but buyers are cautious and sales are so scarce that no change in prices we quote is warranted. Local steel mills are not offering above $11.25 for heavy melting steel, while most dealers seem to be holding their stocks for upturn.

PRICES STIFFEN

In the Buffalo Pig Iron Market—Moderate Sales.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, Sept. 2.

Pig Iron.—The placement for the week amounted to about 10,000 tons, with an inquiry for an additional 8,000 to 10,000 tons remaining to be booked. Prices have stiffened to the extent of widening the spread, by an advance on the maximum in several of the grades, including No. 1 foundry, No. 2X foundry and malleable, noted in the schedule of quotations being asked in this city. While this increase is only 25 cents a ton, most of the interests are able to place the iron taken at the maximum, rather than at the minimum of the schedule.

In addition to the placement and the inquiry, the furnaces all report an improved undertone to the market and are looking forward to a decidedly increased degree of activity to develop and continue over the last quarter of the year.

Finished Material.—While the mills and agencies of the district have no large placements to report, they say there is a scattered and urgent inquiry for small lots of stock sizes, going to the producer who can guarantee the best deliveries. There is a better demand for wire and wire products, but no improvement in price. There is also a noticeable demand for track supplies. In summing up the business of August, the producers here say that the total was in excess of the business taken in June or in July of this year. Prices on all lines are holding firm, with the exception of wire. Specifications continue to come in, scattered new business is developing and there are still no evidences of cancellations or a disposition on the part of the interests here to cut prices.

The fabricators of the district are all busily engaged in getting out material under contract. Some have work for three and four months ahead. While no new undertakings have come into the market in the last week requiring large tonnages, there are a considerable number of jobs being figured taking limited amounts of steel, but aggregating quite a tonnage.

Old Material.—Trading is still on a nominal basis, there being only a slight amount of activity in borings and turnings, with the demand continuing to come from the valley. The attitude of the consumers seems to be to play a safe game, by not negotiating for, or placing orders above the amount needed to meet their bare requirements. The leading interest is not at this time in the open market for heavy melting steel. Prices are stiffer, if anything, but not sufficiently so to cause a change from the schedule quoted a week ago. The dealers are still looking for an improvement in keeping with that noted in the pig iron market.

Strike is Settled

The strike of the structural iron workers in Buffalo, involving over 200 men, has been settled. The men who were out over three weeks returned to work on all the jobs Sept. 2. Negotiations leading up to a settlement were started nearly a week ago. Last Thursday, the men arranged a meeting with the Steel Contractors' Association, of which George S. Kellogg is president, representing the employers. Meetings on Friday and Saturday of last week resulted in the men agreeing to compromise their demands. They were getting 60 cents an hour. They asked 65 and settled their differences by accepting 62½ cents per hour.

Buying in Small Lots at Cincinnati

Fairly Good Inquiry for Pig Iron and Some Improvement in Sentiment — Warehouse Business is Slow

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, Sept. 2.

Pig Iron.—Two fairly good inquiries have appeared in the market within the past couple of days and if both of these are closed within a reasonable time, they should have a fairly good effect upon conditions in general. One is from the Platt Iron Works at Dayton, O., for 1,200 tons of northern No. 3, 900 tons of southern No. 2 and 400 tons of southern No. 3. The other is from the Globe Stove Co., at Kokomo, Ind., and calls for 2,500 tons of northern and 2,500 tons of southern foundry iron. There is also an inquiry for 500 tons of southern foundry iron from Cleveland territory and one for 200 tons in central Ohio to be divided equally between northern and southern grades.

Buying and selling is being done mostly in small lots and dealers here generally report the volume of sales rather light. Southern No. 2 foundry iron is still quoted at $11, Birmingham basis, for last half delivery. While very few furnaces will quote into the first half of next year, it is understood that one or two interests will accept $11.25 for first quarter, and $11.50 for first half, Birmingham basis, for strictly No. 2 foundry iron.

Southern Ohio No. 2 foundry iron is holding at $14, Ironton, for last half delivery. All efforts of buyers to break this price have proven unsuccessful, although they have attempted many times recently. There appears to be a better feeling among the trade in general. From all appearances, there are not so many "feelers" being sent out in the form of inquiries as was the case about a month ago, which indicates that the melters who need iron are thinking of closing for last half requirements. It is probably true, though, that most of the users in this territory have contracted for sufficient iron to carry them through to the first of next year. There are no indications of the present prices breaking but on the other hand an immediate advance does not seem probable.

Coke.—The coke situation is drifting along from week to week without any apparent change. Prices are very firm and although very little buying and selling is being done the situation is strong. This is probably due to three things. In the first place, operators, especially in the Pocahontas and New River fields, are finding it more profitable to sell their coal than to turn it into coke, thereby decreasing the production in certain districts. The labor situation as a general rule is very acute and some of the ovens are only operating at about 65 per cent of their full capacity because of the shortage of help. Also at this time of the year most of the good railroad equipment is being utilized to ship the crops throughout the country with the result that there is a decided shortage of cars in the coke fields. Indications of a change in prices either one way or the other are not apparent.

Finished Material.—The local sheet market remains fairly strong and prices are holding generally above the levels that are being maintained in surrounding territories. This is probably due to the fact that the local mill is receiving specifications on old contracts and for new orders in better lots than for a few weeks previous, and the outlook for a good fall business is bright. Farmers throughout the west are beginning to buy as is the custom about this time of the year, and they generally take a good tonnage of sheets from this mill through the jobbers. Prices are 3.30c for galvanized sheets, No. 28 gage, and 2.25c for black sheets, No. 28 gage, both Pittsburgh basis.

Warehouse business is rather slow with prices unchanged. The local teamsters' strike is still handicapping deliveries in this city, but outside business does not show any improvement. There is apparently no special demand for any one material carried in stock here, with the probable exception of concrete reinforcing bars, which latter are selling in fair lots, probably because contractors are anxious to close up their work now in progress before too late in the fall.

Old Material.—There has been no apparent change in the scrap iron market during the past week. Conditions have now remained the same and prices have not changed for a long time. There has been a little better demand for No. 1 machine cast since the settlement of the iron molders' strike in this city a week or so ago, but not enough to give any indications of an advance in price. Stove plate has also been selling spasmodically in fair lots, the takers being generally brake shoe manufacturers from nearby territory. The local teamsters' strike, which has now been in progress for about seven weeks, has handicapped conditions locally, in that deliveries cannot be made with any degree of satisfaction. Prices as a general rule are none too strong and there is no indication of a strengthening in the near future.

HEAVY SHIPMENTS

Will be Made From the Mary Charlotte Mine, Says Mr. Kaufman.

The Mary Charlotte Mining Co. will this season make the heaviest shipments to its credit in any year since its Negaunee mines were opened, according to H. L. Kaufman, the vice president, says the *Daily Mining Journal*, of Marquette. It is now expected that before the season of navigation closes 600,000 tons of ore will be sent down the lakes. Of this 400,000 tons will go forward from the Mary Charlotte, 100,000 from the Breitung Hematite and about 80,000 from the Washington mine at Humboldt. The company's mines are being worked with large forces, though they are not the largest employed at any time since they were opened. Much of the shipment to date has been from stockpile and has represented last winter's output of the mines. There is still some 200,000 tons of ore in stock at the Mary Charlotte, practically all of which, Mr. Kaufman expects, will be sent out before the season of navigation comes to an end. In fact, the shipments still to be made are so large in total that it will require an unusually heavy daily movement to complete them.

"The season of 1913 has not, from the ore sellers' viewpoint, borne out its early promise," Mr. Kaufman asserted yesterday. "It was looked forward to as one that would be marked by unusual activity and a record-breaking movement. It is still possible that the movement will exceed that of last season, 48,000,000 tons, approximately, but in any event the gain will not be great, and the movement will fall short of what was early predicted. Many mines have found their customers unwilling to take all the ore it was expected they would need this season, and large quantities will be carried over at the mines, on postponed orders, to be delivered next season."

Improved Tone in Finished Materials

In Eastern Pennsylvania—Prices Are Irregular—Price of Connellsville Coke is Shaded

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
611 Bulletin Bldg.,
Philadelphia, Sept. 2.

A little better tone is shown in the finished steel industry in eastern Pennsylvania. New tonnage has been slightly heavier, though it is still considerably below mill capacity. Prices show irregularity. The pig iron movement is good and the market gains strength. Old material is looking better and sales are more numerous. A development of importance is the weakening of Connellsville furnace coke below $2.50, ovens, in sales for eastern delivery.

Pig Iron.—A good buying movement in foundry and lower silicon irons is steadily adding to the firmness of the market, and underlying conditions on the whole appear much sounder. Small sales continue very numerous and the aggregate tonnage is favorable. Prices on northern grades of No. 2X have been more firmly established at a minimum of $15.75, Philadelphia, and incline as high as $16.50 to $16.75 in a few cases. Lebanon valley makers have advanced to $15, furnace, for No. 2X, equivalent to $15.80, Philadelphia.

The Baldwin Locomotive Works bought 4,000 tons of No. 2X at a reported price about $15.25, delivered. It is not definitely stated where the business went, but the price would indicate that southern makers were successful, as was the case of a lot of lower silicon iron to the same buyer, as reported last week. Virginia makers still quote from $13 to $13.25, furnace, for No. 2X, but the lower price is confined to only one or two sellers. New business the past week with these furnaces has not been so liberal. Pipe foundries continue active buyers. One pipe maker took about 5,000 tons additional of southern under grades. Another bought a good-sized lot of Northern forge. An eastern Pennsylvania iron mill is figuring upon a round block of standard forge. As a result of the heavy recent selling of Alabama iron, one leading southern maker has advanced from $11 to $11.50, Birmingham, for No. 2. No further sales of basic have been made, but one central Pennsylvania melter asks 2,000 to 3,000 tons for this year. Eastern basic today is quoted around $15.25, delivered, and some furnaces are asking $15.50, delivered. Several small sales of standard low phosphorus iron are reported at unchanged prices.

Coke.—Some weakness in standard Connellsville furnace coke below the $2.50, ovens, price has now clearly developed. A leading eastern buyer this week took several thousand tons for quick shipment at $2.30, ovens, and there are other reports of $2.35 and $2.45 being offered in the east. Good Latrobe coke is now around $2.25, ovens. The tonnage of prompt coke offered in the east has considerably increased during the past few weeks, and in some cases the ovens are overshipping contracts. There is a current report that one leading Connellsville seller is more disposed freely to accept $2.25, ovens, on prompt fuel.

Iron and Steel Bars.—New steel bar business remains small, but specifications against contracts were larger in August than July. Some reports declare full extras for twisting are not being maintained by all makers. Base prices, however, remain strong at 1.55c, Philadelphia. A Lebanon buyer asks 500 tons and bids will be taken Sept. 17 on 300 to 400 tons of twisted bars for Panama. Makers of refined iron bars report good business, but the market for common bars remains moderate and prices range from 1.25c to 1.35c, mill. Philadelphia jobbers quote iron and steel bars from store at 2c to 2.10c.

Plates. — Liberal new bookings equalling its full capacity continue to be taken by one maker, but orders with other eastern mills run from 60 to 75 per cent. A few small contracts to the year end at 1.45c, Pittsburgh, are reported, and this price rules on the small orders that are quite numerous, but there is shading on the larger tonnages. The Central Iron & Steel Co. will receive 4,000 to 4,500 tons from the Pennsylvania Steel Co. for Brooklyn elevated railway work. A bridge shop asks 1,000 tons and from 4,000 to 5,000 tons of ship plates are still up. A riveted line for North Carolina requiring 3,000 tons will be settled shortly.

Structural Shapes.—Some increase in total tonnage, which is largely in small lots, has been entered by eastern shape makers during the past week, and the tone of the market is better. With some mills new business has reached 75 per cent of full. August, however, was a slow month in specifications and plant activities have been reduced. There is continued evidence that 1.40c, Pittsburgh, or 1.55c, Philadelphia, is being done in some cases, but large eastern companies report they are holding to 1.45c. There are also reports current that extras are being shaded by some mills.

Sheets.—Buyers are putting forth a good demand for heavy gage sheets, and eastern makers have been entering in excess of their current output, so deliveries are not so prompt. Immediate shipment is usually asked by the trade. Prices remain at 1.80c, Philadelphia, for No. 10 gage blue annealed.

Semi-Finished Material.—A better demand for billets in small lots has appeared the past week. A Richmond buyer closed for 3,000 tons of axle billets. Small sales for shipment into the Pittsburgh district are noted. Rolling billets are quoted at $26, eastern mill, and forging billets at $31, upward, depending upon analysis.

Old Material.—Certain grades of scrap are in better demand and in spots prices show more strength. There is an absence of tonnage transactions, however. One large buyer is figuring on a round lot of heavy melting steel, and will pay $12, delivered, but the material is scarce at this price. Small current sales are going at $11.75, delivered. Some buyers report purchases of railroad wrought at $14, delivered. Sales are noted of car wheels at $13, delivered, and of borings at $8.50, delivered. There is some demand for iron axles. Heavy cast is being sought more freely and higher prices are going up to $14, delivered.

Railroad Makes Agreement

It has been announced by Secretary of Labor Wilson that the Baltimore & Ohio railroad and its machinists in shops between Baltimore, Philadelphia, Chicago and St. Louis have entered into an agreement for one year, beginning Sept. 1. Secretary Wilson thinks the agreement will eliminate trouble which has existed since the strike of 1910. The agreement provides for a nine-hour workday, regulation of apprentices, minimum wage scale, increase in wages from 35 to 36 cents an hour and better sanitary and safety conditions for the men.

Southern Furnaces Maintain Prices

Holding Firmly to the $11 Basis—Moderate Sales, But Better Demand Confidently Expected—Scrap Improves

BY W. B. NEAL

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Sept. 2.

Pig Iron.—The local pig iron market was exceedingly quiet during the past week, and conditions are unchanged. However, the inquiry continues active, and a few good sales have resulted. Nothing has transpired to in the least cause apprehension as to a break in the present prices, and all of the several furnace interests are holding firmly to $11 per ton, No. 2 foundry basis, for delivery over the remainder of the year. Considering the fact that the furnace interests are comfortably taken care of in the way of orders during the present year, it certainly is not reasonable to suppose that any concessions will be made in prices in order to move much iron over that period. Therefore, the furnaces are placed in a position where they can well afford to stay on the "waiting list" to at least see what is going to happen between now and the beginning of next year. The tonnage sold within the past week will aggregate 25,000 for shipment in scattering lots over the next 30 to 90 days. In addition to the above tonnage, there was also sold some 2,500 to 3,000 tons of special grade high manganese low phosphorus iron. This last was for immediate delivery. Small melters continue in evidence, while the absence of the larger consuming interests in the trading is very conspicuous. No confirmation has been made of the reported large tonnages sold within the last two weeks, and such sales have apparently had little effect upon the local situation. The general feeling prevailing among the producing interests of the district seems to be hopeful that there will shortly be a substantial buying movement. No one ventures a prediction as to just when this movement will take place, yet all practically agree that there is no reason to fear a "run-away" market.

Cast Iron Pipe.—This market is without any further development during the week just past. While most of the producers report that they are receiving their share of the business, they also insist that the tonnage sought is anything but favorable. Cast iron pipe producers have figured very extensively in recent heavy pig iron sales, and while there have been no large lettings lately, it is the opinion of the trade in general that they are expecting a decided improvement in the demand for this product in the fall season. All of the local plants are managing to operate from one-half to three-fourths of their capacity, and the bulk of the tonnage is being devoted to stocking. With the completion of specifications for Santiago, Cuba, and other requirements for Central America, the unfilled tonnage on order-books has reached a minimum.

Old Material.—The situation of the local scrap market has improved since last report, and several transactions were reported within the week. Heavy machinery cast seemed to be the most active of the several grades; one large dealer reports having contracted for the delivery of 1,000 tons, while several smaller transactions for the same grade were reported. All of the engagements were for immediate delivery, and practically all of the dealers participated in the trading. No further revision in prices is authorized, although an advance in one or two grades is expected shortly.

New York Buyers Show More Interest

In Pig Iron Market—Some Interest Shown in Requirements for Next Year—Quiet Conditions in Plates

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg.,
New York, Sept. 2.

Iron Ore.—The ore market is very quiet. The steamer Ogeechee, with 3,000 tons of iron ore from the Texas properties of the East Texas Brown Ore Development Co., is now expected to arrive at Philadelphia the latter part of the current week.

Pig Iron.—Consumers of iron are beginning to show some interest in their requirements after January. An Ansonia, Conn., buyer asks 2,000 tons of 3 per cent foundry iron for shipment through February. A Providence manufacturer of fine apparatus has been figuring on 1,500 tons or more of foundry grades, has bought some tonnage for the first quarter. A New Jersey buyer recently purchased a small lot for first quarter. Prices for first quarter are still indefinite as most makers have not yet had occasion to commit themselves, but the talk usually runs to 25 cents' advance. A report has been current that certain Buffalo makers would accept $14 for first quarter, but it is understood sales for this delivery have been actually made at $14.25, furnace. The market continues to show a fair movement. The General Electric Co. has distributed at least part of its inquiry, totalling 11,550 tons, principally that for Schenectady and New England plants. It is understood to have obtained less than $16.45, delivered, or $14, Buffalo basis, for the New England plants. A Paterson buyer has taken 900 tons of 3.00 to 3.25 silicon iron at $15.75, delivered, or $14, furnace, from a Buffalo maker, and 600 tons of No. 2 plain at $15.25, delivered, which it is understood will come from a western Pennsylvania maker. It develops that the Crane Valve Co., Bridgeport, bought considerably more iron and paid higher for some of it than recently reported. It took 2,500 tons from a Lebanon maker, paying $16.05, delivered, for No. 2X, and more for the higher silicon, and in addition is understood to have bought a round lot of Buffalo iron around $15.65, delivered, as reported. Lebanon makers have now advanced to $14.75 to $15, furnace.

Ferro-Alloys.—The project now in view of making merchant ferro-manganese in this country provided the duty enactment is favorable, contemplates the use of some high manganese Lake Superior ores, it is understood. No further developments in this enterprise have been learned. Market conditions are quiet. Prices are more or less uncertain. One buyer asking less than 100 tons of prompt reports having received no bids under $56.00, seaboard, while it is rumored that on a lot for western shipment, $54.00, seaboard, was done. Other alloys are quiet.

Plates.—Quiet conditions still rule in the car market, though August was a slightly better month than

July, and there is little more inquiry at present. A fair tonnage in miscellaneous lots continues to move in eastern territory, and prices vary from 1.40c to 1.45c, Pittsburgh, in accordance with desirability of the order. The larger mills are holding for 1.45c.

Structural Shapes.—New business in structural shapes taken by eastern mills during August was of light proportions and the smaller of these makers have not much tonnage ahead of them at present. Operations have been declining, but a little better tonnage in miscellaneous lots is reported the past week. The larger eastern mills and Pittsburgh makers still report a strong condition in bookings and they appear to be holding firmly at 1.45c, Pittsburgh, or 1.61c, New York. The shading by the smaller mills generally still amounts to about $1.00 a ton on attractive business.

Cast Iron Pipe.—It is expected that bids will be asked within the next week or 10 days for the Catskill aqueduct line to Staten Island, which will involve a heavy tonnage of 36-inch flexible joint pipe. No decision has been reached as to the award of about 10,000 tons of cast iron segments for Queens sewer construction, bids for which were taken from the general contractors the past week. New business is not brisk and prices are soft. Eastern shops continue to run about 75 per cent of capacity.

Iron and Steel Bars.—Leading makers report steel bar specifications are very well maintained and some of them are unable to make but slightly improved deliveries. As a rule, however, the mills are shipping much more promptly. New business is slow. Bar iron continues to hold at about 1.25c to 1.35c, mill, among metropolitan and eastern Pennsylvania makers. The market has little snap. It is reported that one small iron mill in this territory now idle will be dismantled.

Old Material.—The scrap market still lacks animation. The margin between buying and selling values remains too small to permit the dealers to do other than an odd-lot business. Furthermore, buyers seem under no pressure to take on large lots. The demand for specialties remains better than for the tonnage grades.

Rates on Pig Iron.—The Delaware, Lackawanna & Western Railroad Co. and the Delaware & Hudson Co. have been granted authority by the Interstate Commerce Commission to establish a rate of $1.20 per gross ton of pig iron, carloads, from Black Rock, Buffalo, East Buffalo and Harriet, N. Y., to Albany, Cohoes, Green Island, Schenectady, Troy, Waterford and Westervliet, N. Y.

LIGHT LETTINGS

In Structural Material—Important Projects Pending.

Structural lettings in New York and eastern districts this week have been very light. Further tonnage for Boston pier improvements is now coming out. A new hotel project in New York City will require 15,000 tons or more. The Ford Motor Co. service plant at Philadelphia will run 4,000 tons at least.

No structural contracts of importance were placed with fabricators in the Pittsburgh district this week, and no interesting projects are under consideration. Present plans for the Lincoln Memorial at Washington call for about 3,000 tons of sheet piling for foundation work.

No large fabricating projects are pending in the west. New business consists largely of small orders. Ten contracts were reported in this market last week and their aggregate steel requirements are 3,057 tons. The average of each job is only a little over 300 tons and the heaviest contract will require but 563 tons.

STRUCTURAL AWARDS.

Kresge 18-story building, Detroit, 2,000 tons, the American Bridge Co.

Extension to Brunots Island power station Duquesne Light Co., Pittsburgh, 500 tons, the McClintic-Marshall Construction Co.

Coal handling plant, Forged Steel Wheel Co., Butler, Pa., 400 tons, the McClintic-Marshall Construction Co.

Sefton Investment Co., Hotel building, Los Angeles, 600 tons to the Baker Iron Works.

Electric Steel Elevator Co., grain tanks, Minneapolis, Minn., 563 tons, to the Minneapolis Steel & Machinery Co.

Crescent Elevator Co., grain tanks, Minneapolis, Minn., 450 tons to the Minneapolis Steel & Machinery Co.

Iowa Bridge Co., one 960-foot viaduct, 343 tons, to the Modern Steel Structural Co.

Walker Johnson building, Washington, 600 tons, to Barber & Ross. Plain material to be furnished by Bethlehem Steel Co.

CONTRACTS PENDING.

Approaches to the Commonwealth pier, Boston, about 2,000 tons. Bids asked.

Hotel, 24-story, to occupy site on Broadway between Forty-Fourth and Forty-Fifth streets, New York City. Plans in preparation. Wells Construction Co. awarded general contract. Estimated on preliminary announcement of plans steel requirements will reach 15,000 tons or more.

Service plant for Ford Automobile Co., Philadelphia. Revised estimates place tonnage at 3,000 or more. Bethlehem sections specified.

Addition to Wm. Taylor, Son & Co. store, Cleveland, 600 tons. To be awarded in three weeks.

Post office at New Haven, Ct., 1,000 tons.

Lincoln Memorial, Washington, 3,000 tons sheet piling.

RAILROAD BUYING

Includes Fair Tonnage of Bridge Material—Car Orders Light

An eastern road has bought 2,500 tons, another is closing for 4,000 tons and some smaller sales of rails, all for early delivery, are being made, but no tonnage of size for next year's shipment has yet been formally closed. The New York Central system is advancing its budget, but the final word has not yet been said as to the tonnage it will take. A fair amount of miscellaneous bridge work continues to come out. The Northern Pacific has not yet closed against its inquiry for 3,400 tons. Car buying is dull but there is a little more figuring being done. Total orders in August reached about 2,000.

A couple of western lines are entering the market in a small way for their fall bridge requirements. The Northern Pacific is inquiring for 3,500 tons of miscellaneous bridge material. The western roads seem content to let the car market alone until financial conditions are more satisfactory.

CAR AND LOCOMOTIVE ORDERS.

The Boston & Maine railroad is taking bids on 1,000 gondolas and 5,000 center sills.

The New York, New Haven & Hartford has ordered 100 coaches of the Osgood-Bradley Car Co. and is still in the market for other passenger equipment.

The Bingham & Garfield railroad has ordered 25 ore cars of the Pressed Steel Car Co.

BRIDGE AND STRUCTURAL WORK.

Philadelphia & Reading railroad, track elevation work at Olney, Pa., 800 to 1,000 tons; bids asked.

Pennsylvania railroad, several small bridges aggregating 500 tons or more, largest of which will cross Susquehanna river; bids asked.

BRIDGE AND STRUCTURAL WORK.

The New York Central & Hudson River Railroad has awarded 400 tons for another area of the New York City terminal improvements to L. F. Shoemaker & Co. and is still in the market for about 1,500 tons of various work.

Maine Central Railroad bridge at Augusta, Me., 2,500 tons, finally awarded to the Phoenix Bridge Co.

New York Central & Hudson River Railroad station work at Rochester, N. Y., 800 tons. Bids asked.

Chicago, Burlington & Quincy Railroad Co., one 105-foot through girder span, 106 tons, to the American Bridge Co.

Chicago, Milwaukee & St. Paul Ry. Co., type C-3 and C-4 through girder spans, 465 tons to the American Bridge Co.

Chicago, Milwaukee & St. Paul Ry. Co., bridges A-482, C-226 and Marshfield avenue subway, 137 tons to the Wisconsin Bridge & Iron Co.

F. Felkel & Sons, architects and engineers, Pittsburgh, and pioneers in the development of modern industrial plants, have opened an office at 404 Marshall building, Cleveland.

Crisis Near in British Pig Iron Market

Some Furnace Operators Threaten to Blow Out Their Stacks — Further Reductions in Finished Material Quotations

London, Sept. 2. (By cable.)—Cleveland warrants, 55s 10½d, a decrease of 1½d.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Aug. 23.

Pig Iron.—It is clear that a crisis is approaching in pig iron. A number of smelters have declared their positive determination to blow out furnaces rather than accept present prices, and arrangements have been made for taking this course at four furnaces, chiefly in Derbyshire. The frequent statements that pig iron is being made at a loss are generally accepted. Although coke has fallen in price, it is still above the average, and wages are relatively high. The slump in Northamptonshire and Derbyshire brands has been severe, representing about 20 shillings per ton since February. One Northampton furnace has been blown out this week, the owner having accumulated as much stock as he considered safe to operate with. A remarkable feature is that warrant stores continue to show a steady reduction, the amount being about 8,000 tons less for the month, and 100,000 tons less than a year ago. Shipments are satisfactory, representing about 45,000 tons since the beginning of August. Cleveland prices have fallen 5d this week, the quotation being 54s 7d ($13.36) as against 55s ($13.46) last week. The tone is decidedly more hopeful, although actual purchases are restricted to small lots. The hematite department shows rather more strength than ordinary pig iron, in spite of the reduction in finished steel. East Coast mixed numbers are quoted at 70s ($17.14) for early and forward delivery. For the first time for many months, Birmingham pig iron buyers on 'Change on Thursday were ready to place large contracts running up to a thousand tons, but in every case smelters declined to look at such large quantities in the present unprofitable state of prices, though one or two lots amounting to 200 and 300 tons were booked. It is believed that the small buying period will extend to another week or two. In the Barrow-in-Furness district, the hematite trade has been so unsatisfactory that several furnaces have been damped down. It is believed, however, that this will be a temporary measure.

Finished Iron and Steel.—Some further reductions have to be recorded in the finished department. The makers of hard basic billets have lately reduced their quotations by 10s ($2.44) per ton, making the official price at Sheffield £6 ($29.38). In the West of Scotland, manufacturers have followed the reduction of 10s ($2.44) per ton declared a week ago. It appears to be agreed that the reductions have brought practically no new business and from this point of view some steel makers are criticizing the reductions as unnecessary. Oddly enough, some of this criticism, according to Birmingham merchants dealing with the Continent, comes from Continental houses which are openly declaring that the reduction is needless. Naturally, this criticism is not being taken very seriously by British houses, whose non-success in meeting foreign competition led them to demand this reduction. The steel trade is not so satisfactory as it has been, and certain makers are obliged to make short time. A remarkable feature is the cheapness of steel hoops, which can now be bought for £7 5s ($35.50) or 5s ($1.22) below bars. For many years the relation was different, buyers always being called upon to pay more for hoops than for bars.

In the raw steel market, there is a disposition, on the part of makers, to set their faces firmly against further reductions. In South Wales, the price has been pulled down to £4 17s 6d ($23.86) for Bessemer, with 2s 6d (60c) more for Siemens. At these figures it is said the selling prices are right down against the profit margin, and makers declare they will shut down their works rather than further reduce. Foreign billets and bars, apparently, are not competing very seriously with British raw steel just now.

Railway steel continues decidedly quiet, wagon building having experienced a slump. There is still an excellent demand for tramway points, crossings, layouts and rails generally. The armament department continues as busy as ever; all the Sheffield firms which work for the Admiralty are as active as they can be. Several new contracts have been given out to Sheffield firms, including a superdreadnaught of a new type built by Messrs. Vickers. Large quantities of armor plate and guns are being manufactured for foreign warships building in British yards. In the railway department, the colonies are placing contracts much more liberally than home railways. The boom in special steel shows no sign of diminution, in spite of strenuous foreign competition, and there is an excellent demand for all kinds of agricultural steel. The demand for certain motor car steels is so great that Sheffield has been unable to cope with them, and they have had to be placed abroad.

In the iron trade, galvanized corrugated sheets show a slight improvement, with an upward tendency in prices. Makers are now able to obtain a minimum of £11 ($53.84) and in some cases are getting £11 10s ($55.28). A meeting of the gas strip makers on Thursday decided not to make any further reduction in prices, although trade is as dull as it can be. Apparently, all the mills in the Black Country are on short time. There is still a disposition to buy only the smallest quantities, the belief being that those who can wait for material will get them at a somewhat lower price.

Quite a number of Sheffield firms are still engaged in extending their works, a policy which indicates a fair amount of confidence for the future. This week, an order for 11,000 tons of rails for the East Indian railway has been placed with Messrs. Dorman, Long & Co., of Middlesboro.

It is stated that a general reduction in the price of wrought iron tubes will be declared during the next day or two.

In the tinplate department, where there is a slightly better inquiry, the volume of business is small, and prices are being cut to tempt orders. The general price is 13s ($3.18) to 13s 1½d ($3.21) per box for Bessemer coke primes. It is considered, however, that the outlook for the autumn is somewhat more cheerful.

Personals

J. Tatnall Lea, of Philadelphia, has resigned as a director and vice president of the Lake Superior Corporation, to take effect Oct. 1.

Louis Sacks, of the Louis Sacks Iron Foundry Co., Newark, N. J., will sail for Europe on the steamship Celtic, Sept. 18. Mr. Sacks plans to make a tour of Great Britain and the continent.

B. F. Bourne, of the Bourne-Fuller Co., Cleveland, has returned from a trip to Europe.

FOREIGN MARKETS

BELGIAN IRON TRADE

Brussels, Aug. 21.

A better tone is registered on the Belgian metallurgical market. Germany is not competing so keenly on the international market, and our producers have succeeded in obtaining increased prices of from 1 to 2 shillings (24½-49 cents), notably for bars and certain other descriptions. Plates, on the other hand, are rather weak and orders received on their account are ominously few. Export prices are as follows: £4 16s to £4 17s ($23.37 to $23.63) for steel bars; £4 18s to £4 19s ($23.85 to $24.09) iron; £5 3s to £5 4s ($25.07 to $25.31) for rods; £5 8s ($26.29) for heavy steel plates; £5 10s ($26.77) for medium; and £5 14s ($27.75) for plates under 1/16 inch thick, always steel. Finally sheets are held at about £6 10s ($31.64), but the buyer is not easily persuaded even at this price. In the country prices are 13.50 francs ($2.56½) for steel bars; 14 to 14.50 fr. ($2.66 to $2.75½) for iron bars; and rods value 14 to 14.25 fr. ($2.66 to $2.07¾). Heavy plates in steel are 14.25 fr. ($2.70¾) and sheets 17.25 fr. ($3.27¾), but there is no activity on the market. None of these goods can be called in demand.

RUSSIAN IRON TRADE

St. Petersburg, Aug. 20.—The Russian metallurgical market is still strong. The Prodameta or syndicate, which was not taking orders so rapidly for a time, is enjoying fresh progress. The grain harvest which is proceeding shows every sign of being heavy, and this is adding to the good tone of the markets generally. The Prodameta Metallurgical Syndicate has increased prices by 3 to 5 copecks per pood (1½-2½ cents per 36 pounds) for merchant iron in certain parts of the country. Roofing iron is prosperous and stocks are being gradually shifted both in the Urals and in the south, and there is a tendency for prices to rise. Owing to a certain slackness in the building industry, the home trade in girders is rather slack. A source of anxiety which may lead to an appreciation in the price of Russian metals is the petroleum crisis brought about by the strikes of the workmen at Baku. The result has been a great rise in the price of liquid fuel and this cannot fail to be followed by a similar rise in the price of coal, so that the South Russian metallurgical, as well as other works, will soon be in straits for fuel at reasonable cost.

GERMAN IRON TRADE

Saarebruck, Aug. 21.

Resulting from the fact that on the Belgian market for some time there has been a revival from the very low level to which bar iron had declined, it appears that a reaction will also take place on the German market. It is observed that the decline has been brought to a standstill on the Rhine. The somewhat rapid downward movement had brought the price down to 90 marks ($21.15) per ton at Neunkirchen, but, thanks to the better tone of export orders, this price proved to be but temporary. Still, revival can only be spoken of with some diffidence. All the same it is generally assumed that bottom has been touched. It is also observed that the reserve recently maintained by buyers has been considerably modified, and there has been a better current of inquiries for prices and at the same time new orders are being booked. Specifications are coming in for stock goods and the time for delivery required is from six to eight weeks. But notwithstanding all these better symptoms, no one will go so far as to state that prices will be better for some time to come.

AUSTRIAN IRON TRADE

Vienna, Aug. 21.

The effects of the Balkan crisis are being very seriously experienced by Austria-Hungary, and the orders in the hands of the metallurgical works, particularly those of the Cartel, are exceedingly limited. Last month the quantity dispatched was 534,342 metrical quintals against 522,990 in June and 775,647 metrical quintals in July, 1912. The total orders executed for the seven months of the year do not exceed 3,967,379 quintals or 1,030,614 quintals less than in the corresponding period of 1912. The decline has been most severe in bars and sections. It has been heavy also in girders and plates. There has been an appreciable increase, however, in rails.

LUXEMBURG IRON TRADE

Esch, Aug. 21.—Interesting figures just published show that the iron and steel industry of Luxemburg was very prosperous in 1912. The production of iron ore was 6,553,930 tons, against 6,059,797 tons in 1911. A decrease was again noticeable in the exports to Belgium, the principal foreign market for iron ore. From 1,437,500 tons in 1911 the exports fell to 1,365,000 tons in 1912. The share of Luxemburg in the supply of the Belgian market, which was 55 per cent in 1907, fell successively to 51 per cent in 1908, 37½ in 1909, 31½ in 1910, 27 in 1911, and 21.3 per cent last year, the reason lying in the preference given by Belgian blast furnaces to the ores coming from the Briey basin, in France. The output of pig iron was the largest on record, and amounted to 2,252,229 tons, an increase of 523,256 tons, or about 25 per cent over the figures of the previous year. The output of steel of every kind was 947,184 tons, against 716,914 tons, an advance of 230,270 tons, or about 35 per cent. The value of the production rose from 102,000,000 to 136,000,000 francs ($19,380,000 to $25,840,000) for pig iron and from 89,000,000 to 125,000,000 francs ($16,910,000 to $23,750,000) for steel. The number of blast furnaces in operation during 1912 was 43.

It is reported from Esch also that several large East French industrialists have entered into an agreement for the institution of a share company, the chief object of which will be the export of French Minette ore to England and the importation of English coal into France. It is believed that the new concern will be definitely constituted very soon.

FRENCH IRON TRADE

Paris, Aug. 21.

Metallurgy in France is still quiet. Prices are as follows: Merchant iron, No. 2, 20-21 francs ($3.80-$3.99), Paris; 17 francs ($3.23), Nord. Merchant steel, 20-21 frances, Paris; 18 francs ($3.42), Nord. Special steels, 20.50-22.50 francs ($3.89½-$4.27½), Paris; 20 francs, Nord. Sheets, 21-23 francs ($3.99-$4.37), Paris; 20.50 frances, Nord. Girders, 22-23.50 francs ($4.18-$4.46½), Paris. Plates, 3 mm. and over, 23-25 francs ($4.37-$4.75), Paris; 20 francs,

Nord. Although the market is quiet at the moment in anticipation of better times, as the result of the conclusion of peace, the industry is developing at a rapid rate in the Meurthe-et-Moselle. As a matter of fact, one of the questions most exercising the minds of metallurgists at the moment is how they are going to supply the new blast furnaces that are being erected with coke. In reviewing the position which is so menacing from the fuel point of view, a complete statement is given of the number of blast furnaces in the country since 1905. Where in the east there were 84, now there are 89; in the north there were 18, now there are 24; and in the center and southwest there were 54, but now only 46. The statistics of iron production show that the increase in the production of coke in the country does not keep pace with the increase in metal production. The problem will partly be solved, it appears, by the metallurgical works erecting their own coking ovens. For example, the Pont-a-Mousson Blast Furnaces & Foundries Co. has just decided to construct 80 coking ovens and it is believed that in order to supply these ovens, coal will have to be brought from a variety of countries. It is not thought that France will be able to provide the requisite raw material at prices and in quantities convenient for the purpose.

HEARTY CO-OPERATION

Of Bankers and Framers of Currency Bill Favored.

Prominent business men, some of them of high position in the iron and steel industry and in the manufacturing world, recently have given their opinions to the *New York Times* upon the advisability of hearty co-operation between the framers of the currency bill now pending in congress and the bankers of the country. This newspaper in its inquiry to various prominent business men, had suggested that there appeared to be an absence of close understanding between the framers of the bill and the bankers.

J. F. Welborn, president of the Colorado Fuel & Iron Co., Denver, Col., gave his opinion as follows:

"I feel strongly that the best interests of business men and the country at large would be served by a free exchange of opinion between the framers of the currency bill and representative bankers and hope the opportunity for such exchange of opinion will be given."

James C. Wallace, president of the American Ship Building Co., said:

"I always believed that men experienced in any class of business who have been tried out and proved successful are better able to formulate the policies of the concerns that they are handling whether they be banks, railroads, or industries than a miscellaneous set of men that have never had any experience in managing affairs of any kind, and in most cases have not been successful in handling anything. Therefore, I should say that, beyond any question of doubt, it would be advisable for the framers of the administration currency bill to have the benefit of all the advice they could get from men experienced in the handling of the finances of the country and that they should be guided by such advice."

E. C. Simmons, of the Simmons Hardware Co., St. Louis, said:

"The necessity for harmony in judgment and co-operation in action makes it exceedingly imperative that there should be a very free exchange of opinion between the framers of the administration currency bill and our representative bankers. This free exchange of views is of the greatest importance to the business interests and affects the welfare of every man, woman and child in the United States. Bankers know more about this matter than anybody else; their opinions are based solely on the best interests of all of the people, and should be most patiently and carefully considered."

"Too much care and deliberation cannot be spent on so difficult and important a work as the establishment of a currency and banking system," said James J. Hill. "There should be free and full consultation in a spirit of conciliation between all the interests represented in or affected by the currency bill in view of recent gains in business by banking institutions working under state laws as compared with national banks. Special care should be taken to avoid imposing on the banks conditions so onerous or impracticable as to assure in advance the failure of the new plan. A new financial system for a great country cannot be devised without much study and co-operation. Full conference between all parties concerned would seem to be very desirable."

The Davenport Locomotive Works, Davenport, Ia., has just completed and shipped a new type of locomotive. Power is communicated direct from the cylinders through a spur gear to the axles.

METAL MARKETS

New York

Sept. 2.

Copper.—Leading sellers showed no disposition to meet concessions in copper metal prices made by second hand and some of the small producers during the latter part of August. The latter met a sufficient demand to pretty well clean up the cheaper metal, and at the opening of business today, with a good volume of inquiry in the market some of the largest agencies raised their asking prices to 16.25c for electrolytic. The general feeling is that little metal will be available under that figure by the end of the current week. Lake copper scarce, due to the unbroken restriction on production. The Calumet & Hecla is not offering in the open market, but is said to be supplying regular customers at around 16.50c. Casting is offered at 15.75c to 15.87½c.

European statistics for the last half of August show that stock 620 tons.

Exports from the United States during August was 34,722 tons. Standard copper closed in London today at £71 12s 6d for spot and £71 8s 9d for three months.

Tin.—An active business was done in tin in the domestic market during the last half of the past week. Consumers bought freely and dealers also displayed confidence in the future value of the metal by replenishing their stocks liberally. The effect of the good demand on prices has been an advance to £195 10s for spot and £194 15s for futures in London and to 43c for spot September, October and November, in the local market.

Deliveries into domestic consumption amounted to 3,600 tons in August and arrivals for the same period were 3,534 tons. Stocks at local points aggregate 1,408 tons, and there are 2,912 tons afloat. The world's visible supply as of Aug. 31, is 11,261 tons against 12,063 tons July 31, and 11,285 tons Aug. 31, 1912.

Chicago

Sept. 2.

New Metals.—The resumption of rock shipments from the upper Michigan copper mines has given an easier tone to the western copper market. Spelter continues to advance and buyers are sharply curtailing their orders wherever possible. There has been another increase in the price of sheet zinc and lead is also very strong.

We quote dealers' selling prices f. o. b. Chicago as follows:

Lake copper, carload lots, 15¾c; casting, 15½c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.85c; lead, desilverized, 4.80c; sheet zinc, $8.00, f. o. b. La Salle, in car lots of 600 pound casks; pig tin, 43c; Cookson's antimony, 8¾c, other grades, 7¾c.

Old Metals.—General increases in the price of new metals have been reflected in the old metal market. The volume of business is practically unchanged. Owing to the holiday on Monday, the aggregate tonnage booked last week was light. Dealers report that their August business was practically equal to July.

We quote dealers' selling prices f. o. b. Chicago as follows:

Copper wire, crucible shapes, 13½c; copper bottoms, 12¼c; heavy red brass, 12½c; heavy yellow brass, 8½c; No. 1 red brass borings, 11c; No. 1 yellow brass borings, 7¾c; brass clippings, 10c; lead pipe, 4½c; zinc scrap, 4½c; tea lead, 4c; No. 1 aluminum, 17c; No. 1 pewter, 28c; block tin pipe, 36½c; tin foil, 33c; linotype dross, 3¼c; electrotype dross, 3½c; stereotype plates, 4½c; stereotype dross, 3¼c.

WANT STANDARDIZATION

Boilermakers in Session in Cleveland Seek Uniform Specifications.

Uniformity that would be practical standardization, is the tendency of the American Boiler Manufacturers' Association in session this week in Cleveland. It is the standardization of conditions surrounding the business, and not of product that is sought by members of the association. Three papers were presented Sept. 2 and all pointed to the same goal. For some years one of the objects of the association has been to secure concurrent legislation in various states on boiler specifications, to reduce confusion and make possible a standard that will be acceptable in the entire country. There are now about 100 laws whose requirements the manufacturers are compelled to meet in doing business over many states.

A proposed specification was reported to the association and the effort will be made to have it incorporated into law in the several states. Efforts to have a federal regulation covering this, have failed as the states have the right to prescribe their own regulations.

Thomas E. Durbin, of the Erie City Engine Works, Erie, Pa., read a paper on this phase and showed the need for uniformity in state regulations.

W. C. Connelly, Cleveland, read a paper on shop costs, in which he outlined the approved method of apportioning costs and figuring the distribution of the overhead expense. He showed how a wrong method used by many manufacturers resulted in real loss when the books showed an apparent profit. As a result of the discussion, the chair was instructed to appoint a committee to prepare a uniform cost system, to the end that all manufacturers might have a standardized basis of cost to figure from.

Factory efficiency was discussed by Lucien I. Yeomans, industrial engineer, Chicago. Mr. Yeomans showed that the matter of labor costs has been standardized by the labor organizations and that efficiency has been lessened by the uniform scale which pays to the inefficient workman the same wage as to the efficient, and because of the loss on the wages of the former, the employer is not able to pay the latter his full earning value.

Mr. Yeomans faced his hearers with the statement the unions have had their best and most plausible speakers constantly among the men, explaining, arguing and organizing, and then taunted them with the fact they had been sitting idly by for years and had not sought in any way to combat these arguments, leaving the organizer or agitator alone to hold the attention of the worker without an argument on the other side.

The convention is attended by about 350 representatives of various boiler manufacturers and supply men. This meeting opened Sept. 1 and will continue through Thursday with business sessions and social events interspersed.

Present officers, who doubtless will be re-elected, are: E. D. Meier, New York, president; J. D. Farasey, Cleveland, secretary; Joseph F. Wangler, St. Louis, Mo., treasurer; T. M. Rees, Pittsburgh, Pa.; J. Don Smith, Charleston, S. C.; W. A. Brunner, Phillipsburg, N. J.; H. D. MacKinnon, Bay City, Mich., and M. H. Broderick, Muncie, Ind., vice presidents.

EFFECT OF STRIKE

Shown in Ore Shipments—Decline Compared with July.

August ore shipments totalled 7,677,601 gross tons, a decrease of 82,647 tons from the movement of August, 1912, and a decrease of 526,815 gross tons from the July, 1913, movement. The slump, of course, is at Superior, where the Allouez dock was working throughout the whole month at practically 50 per cent efficiency, owing to the strike. Shipments from this port during the month were nearly 1,000,000 tons less than normal, and, of course, there was some hindrance also at the Missabe dock at Duluth. Had it not been for this, the August movement would undoubtedly have exceeded the July movement. The movement to Sept. 1 totals 32,007,072 tons, as against 29,051,152 tons during the corresponding period of 1912, an increase of 2,955,920 tons.

Following are the comparative figures:

Port.	August, 1912.	August, 1913.
Escanaba	761,717	964,288
Marquette	570,586	598,861
Ashland	761,539	809,597
Superior	2,397,535	1,512,425
Duluth	1,690 650	1,957,239
Two Harbors	1,578,221	1,835,191
Total	7,760,248	7,677,601
1913 decrease		82,647

Port.	To Sept. 1, 1912.	To Sept. 1, 1913.
Escanaba	3,240,011	3,623,632
Marquette	2,001,400	2,155,363
Ashland	2,865,397	3,073,628
Superior	9,066,190	8,585,838
Duluth	6,076,452	7,891,903
Two Harbors	5,801,702	6,676,708
Total	29,051,152	32,007,072
1913 increase		2,955,920

The Pennsylvania Steel Co., Steelton, Pa., started an employment department Sept. 1.

SINK STEEL TUBES

To River's Botton to Provide Tunnel for Subway Railroad.

Four large steel tubes, one for each track of the extension of the Lexington avenue subway, are now being put by contractors in parallel position in the bottom of the Harlem river, New York City. These tubes are to be 1,080 feet long, each being made up of four sections 220 feet long, and one section 200 feet long. They are 19 feet in diameter. The plates used are of ⅜-inch thickness, tank quality, with two feet between adjacent shells, which are concreted to one another by means of steel partition walls wrapped in wooden sheeting. The first section of the tunnels was recently sunk in the river at 131st street after having been towed to the spot by nine flatboats. The supporting craft were scuttled and the tubes gradually settled to their position in the bottom of the river, where they will be later joined with the other sections. The same method of tunnel construction was used in building the double-track railway tunnel under the Detroit river at Detroit for the Michigan Central railroad.

NEW EQUIPMENT

Installed in Power Plants of Number of Steel Companies.

A number of steel companies have recently installed additional electrical equipment furnished by the General Electric Co., Schenectady, N. Y. Among them are:

The American Sheet & Tin Plate Co., Pittsburgh, at Gary, Ind., two 1,600-horsepower mill type motors with sectional control equipments and panels.

The Otis Steel Co., Cleveland, two 4,500-kilowatt Curtis turbo-generator units with a 100-kilowatt turbo-exciter and a 50-kilowatt motor-generator exciter set; two 11,000-kilowatt two-unit two-bearing motor generator sets; three 400-kilovolt-ampere transformers; one 1,600-horsepower, two 1,200-horsepower and one 200-horsepower motors; switchboard panels and accessories.

The Brier Hill Steel Co., Youngstown, O., four 75-horsepower and one 875-horsepower mill type motors.

The National Tube Co., Pittsburgh, in the Pennsylvania works, two 150-horsepower induction motors.

The Illinois Iron & Bolt Co., Carpentersville, Ill. 15 motors ranging from 3 horsepower to 40 horsepower, with oil switches and accessories.

TESTS MADE

Of the Transmission Towers to be Erected in Panama.

Trenton, N. J., Aug. 25.—Under the direction of government engineers, the first of the big towers which are to be used in the Panama electricity transmission line, was tested out a few days ago at the local plant of the American Bridge Co. The inspection met the approval of the engineers and the work of getting out the entire order will now proceed.

The tower stands 40 feet high, while the span between the side frames is 36 feet. This span will set over the tracks of the Panama railroad and the towers will be placed at 300-foot intervals for its entire length. The towers weigh six tons each.

The towers, which go in pairs, are to be placed one on either side of the tracks and joined together about seven feet from the top by a steel frame bridge. From the top of either tower side brackets to support the transmission lines are hung in a direction outward from the tracks.

The tests consisted of applying loads to different sections of the structure. A longitudinal load of 4,430 pounds was required of the bridge or span section, a transverse load of 4,100 pounds was put on the brackets, a load of 1,100 pounds was put on top of the tower, while from the center of the bridge span the principal test, a transverse load of 16,000 pounds, was introduced. The elongations of the different sections of the structure under the strains were all noted. The tests were highly satisfactory to the engineers, there being only one minor recommendation for change.

About 900 towers will be required to cross the isthmus. It is estimated that the order will take until March to fill. About 25 of the towers

Death of Frederick H. Daniels

Frederick H. Daniels, chief engineer of the American Steel & Wire Co.., and a prominent member of the board of engineers of the United States Steel Corporation, died at his home in Worcester, Mass., Aug. 31, after an illness of one year. He was 60 years of age.

Mr. Daniels had been prominent in the engineering field of the iron and steel industry for about 40 years. He achieved high standing, especially through his connection with the wire industry, having taken out 151 patents, the most important on wire rods and wire. He built the first multiple continuous rod mill. In 1900 he received a gold medal from the Paris Exposition and in 1910 was decorated by King Gustave V, of Sweden, in recognition of his engineering attainments.

Mr. Daniels was born in Hanover Center, N. H., in 1853. He was educated in the public schools of Worcester, Mass., and the Worcester Polytechnic Institute. After his graduation from the latter institution in 1873, he associated himself for a period with Dr. Thomas M. Brown, chief of the chemistry department of Lafayette College.

Later Mr. Daniels entered the employ of the Washburn & Moen Mfg. Co., Worcester, and became mechanical and chemical engineer. In 1880, he became superintendent of construction, in 1887 assistant general superintendent and in 1888 general superintendent of all the properties of the company. In 1899, when these properties were acquired by the American Steel & Wire Co.,

F. H. DANIELS

Mr. Daniels became chief engineer of the company and continued in this capacity until the present date.

As a member of the board of engineers of the Steel Corporation, Mr. Daniels helped design the important construction work carried on by that interest, including the Gary, Ind., plant.

Mr. Daniels was a director of the Massachusetts Employes Insurance Association. He was a member of the American Iron and Steel Institute the Iron and Steel Institute of Great Britain, the American Society of Mechanical Engineers, the American Institute of Mining Engineers and the American Society for Testing Materials.

The Southern Shovel Mfg. Co., Gadsden, Ala., is to be reorganized.

OBITUARIES

Jennings S. Cox Jr., general manager of the Spanish-American Iron Co., and widely known as a mining and metallurgical engineer, died at New York City, Aug. 31. His connections for the past 18 years in charge of the development of the Cuban iron ore properties of the Pennsylvania Steel Co. had made him an authority upon Cuban iron ore and had given him prominence in the mining end of the iron and steel industry. He was graduated from the Columbia School of Mines in 1887 and before becoming associated with the Pennsylvania Steel Co., at one time was employed at the Homestead plant of the Carnegie Steel Co. His headquarters in Cuba were at Santiago. Failing health three months ago compelled him to leave Cuba and return to the United States. He was a member of the American Institute of Mining Engineers, of the Alpha Delta Phi fraternity and of the University Club, New York City.

William H. Hollister, a retired manufacturer of Richmond Hill, Long Island, died at the home of his daughter in Passaic, N. J., Aug. 30, aged 81 years. He was the founder and for 36 years manager of the Ramapo Foundry & Wheel Works, Ramapo, N. Y.

Col. Wm. S. Stockton, a mechanical engineer and one of the organizers of the Manufacturers' Club at Philadelphia, died in that city recently, aged 76 years.

Will Urge Anti-Dumping Clause

Much interest is manifested in the anti-dumping amendment to the tariff bill, prepared by Senator Penrose, of Pennsylvania, and which he will discuss when the bill is reported back to the senate. No little surprise was shown when the Democratic caucus struck out the anti-dumping clause.

His amendment proposes a dumping duty which would equal the difference between the export or actual selling price and the actual market value or wholesale price of goods imported for home consumption. It provides that this dumping duty shall not exceed 15 per cent ad valorem in any case, and that "goods whereon the duties otherwise established are equal to 50 per centum ad valorem shall be exempt from such special duty." Goods not dutiable, but unloaded in this country at less than actual market value in the country of origin, would be subject to a duty.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH

(Through This Year.)

Bessemer	$16.65
Basic	15.15
No. 2 foundry	14.90
Malleable	14.90
Gray forge	14.40

The freight rate from valley points is 90c.

CLEVELAND

(Through this Year Delivered in City).

No. 1 foundry	$15.00 to 15.50
No. 2 foundry	14.75 to 15.00
No. 2 southern	15.10 to 15.35
Bessemer	16.65
Silveries 8 per cent silicon	20.05

CINCINNATI

(Third and Fourth Quarters.)

Southern foundry No. 1	$14.75
Southern foundry No. 2	14.25
Southern foundry No. 3	13.75
Southern foundry No. 4	13.50
Southern gray forge	13.25 to 13.50
Mottled	13.25
Southern No. 1 soft	14.75
Southern No. 2 soft	14.25
Standard southern car wheel	27.25 to 27.75
Southern Ohio No. 2	15.20 to 15.70
Southern Ohio No. 3	14.70 to 15.20
Southern Ohio No. 4	14.45 to 14.95
Silveries 8 per cent silicon	18.20 to 18.70

(Freight from Ironton, $1.20; from Birmingham, $3.25.)

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.)

Lake Superior char., No. 1 to 4	$15.50
Northern foundry No. 2	15.00
Southern foundry No. 2	15.35
Jackson co. silveries, 8 per cent	19.40
South'n silveries, 5 per cent sil.	17.35
Alabama basic	15.35
Malleable	15.00

PHILADELPHIA

(Prompt and third quarter shipment delivered to consumer's plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$16.25 to 16.50
Northern No. 2X foundry	15.75 to 16.25
Northern No. 2 plain	15.50 to 15.75
Standard forge (Eastern Pa.)	14.75 to 15.00
Virginia No. 2X	15.80 to 16.05
Southern No. 2	15.00 to 15.50
Standard low phos., Phila	23.00 to 23.50
Lebanon low phos., furnace	18.00
Malleable	16.25 to 16.50
Basic (Eastern and Central Pa.)	15.00 to 15.25

NEW YORK

(Prompt and third quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	$16.25 to 16.50
Northern No. 2X foundry	15.75 to 16.25
Northern No. 2 plain	15.25 to 15.75
Virginia No. 2X	16.10 to 16.35
Southern No. 2	15.25 to 15.75
Malleable	15.75 to 16.00
Gray forge	14.75 to 15.00

ST. LOUIS

(Throughout This Year.)

Southern No. 1	$15.25
Southern No. 2	14.75
Southern No. 3	14.25
Southern No. 4	13.75

(Freight, Birmingham to St. Louis, $3.75.)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	$11.15
No. 2 foundry	11.00
No. 3 foundry	10.50
No. 4 foundry	10.25
Gray forge	10.25
Mottled	10.25
Standard basic	11.50
Off basic	11.00
Charcoal	25.00

BUFFALO

(Through this year, delivered in city).

No. 1 foundry	$14.25 to 14.75
No. 2X foundry	14.00 to 14.50
No. 2 plain	14.00 to 14.25
No. 3 foundry	13.75 to 14.25
Gray forge	13.75 to 14.00
Malleable	14.00 to 14.75
Basic	14.25 to 14.75
Charcoal	15.75 to 16.75
Charcoal (special brands)	17.00 to 20.00

Ferro Alloys

English and German 80 per cent ferro-manganese, prompt and forward delivery, $55 to $56 seaboard.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $26. Eleven to 12 per cent, $25. Ten to 11 per cent, $24. Nine to 10 per cent, $23 f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown, $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 to 30 cents higher, respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	84½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents

Coke

AT THE OVENS.

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.85 to 3.10	$3.00 to 3.25
Furnace coke	2.50	2.50
Wise county district:—		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.25 to 2.50	2.35 to 2.50
Pocahontas district:—		
Foundry coke	3.00	3.00
Furnace coke	2.60 to 2.75	2.60 to 2.75
New River district:—		
Foundry coke	$3.25 to 3.50	$3.25 to 3.50
Furnace coke	2.60 to 2.75	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, prices are: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania, furnace points range from 35 to 75 cents per ton.

Semi-Finished Material

PITTSBURGH

Bessemer 4 x 4 billets with 0.25 carbon and less, $25.00; open-hearth rolling billets, open-hearth sheet bars, $26.00 f. o. b. Pittsburgh and Youngstown. Forging billets, $33, Pittsburgh. Wire rods, $27.50 to $28.00; muck bar, $31, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity; 4 x 4-inch open-hearth and Bessemer rolling billets at $26.50 to $27.00, and forging billets at from $31 to $32; muck bar, $28 to $30.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.45c. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.63c.

PHILADELPHIA

Delivered to consumers in Pittsburgh and vicinity. Standard structural shapes from eastern Pennsylvania mills, 1.55c to 1.60c. From Pittsburgh mills, 1.60c.

NEW YORK

Standard structural shapes delivered at New York by eastern Pennsylvania makers 1.56c to 1.61c. On forward deilvery, Pittsburgh district makers are quoting 1.61c, New York.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¾ to 100 inches, 1.40c to 1.45c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inches thick, 6⅝ to 100 inches wide, 1.63c.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: Tank plates from eastern Pennsylvania mills for prompt or forward delivery 1.55c to 1.60c. The larger Pittsburgh makers quote 1.60c, but smaller mills in that district are doing 1.55c.

NEW YORK

Steel plates, tank quality, for prompt and forward delivery at New York by eastern Pennsylvania makers, 1.56c to 1.61c. The

larger Pittsburgh makers are quoting 1.61c, New York.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	2.15c to 2.25c
No. 30 tin mill black	2.15c to 2.25c
No. 28 galvanized	3.20c to 3.30c
No. 10 blue annealed	1.65c
No. 28 painted, corrugated	2.35c to 2.40c
No. 28 galvanized, corrugated	3.30c to 3.35c
Tin plate, 100-pound cokes	3.60c

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.80c.

Pipe and Boiler Tubes

PITTSBURGH

	Black Butt.	Galv. Weld.
Steel, ¾ to 3 inches	80	71½
Iron, ¾ to 2½ inches	72	61
BOILER TUBES		
Steel, 3½ to 4½ inches	69	..
Iron, 3½ to 4½ inches	58	..

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.35c for open-hearth, carload lots; less than 500 tons 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c base, Pittsburgh; track bolts, 2.40c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.65c.

CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $22 and $23; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.75c to 1.70c; smaller size spikes, 1.85c base; track bolts, with square nuts, 2.20c to 2.25c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.60c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops in carload lots, 1.60c, Pittsburgh; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 to 62 per cent off in carloads and 55 to 57 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron, 1.40c to 1.45c, hard steel bars rerolled, 1.50c; soft steel bars, bands and small shapes, 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars, 1.55c to 1.60c on contract and common bar iron, 1.32½c to 1.42½c. Cut nails 1.90c to 1.95c, Philadelphia. Shafting 62 and 60 off in carloads and 57 and 55 off in less than carloads in base territory.

NEW YORK

Delivered in New York steel bars on contract from 1.56c to 1.61c, and common iron bars, 1.33c to 1.45c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 2.00c, Pittsburgh, cone head boiler rivets, 2.10c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 2.03; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, small and shorter, rolled threads, 75 and 10; cut threads, 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10 and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅝-inch and larger, $6.60 off; ½-inch and smaller, $7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.65; retailers' carload lots, $1.70; cut nails (western makers), jobbers' lot, $1.65; painted barb wire, jobbers' carload lots, $1.65; retailers' carload lots, $1.70; plain wire to jobbers in carloads, $1.45; and to dealers in carloads, $1.50; polished staples, $1.65; galvanized staples, $2.05.

CHICAGO

Wire nails, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.93; painted barb wire, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.93; with 40c for galvanizing; plain wire, jobbers' carload lots, $1.63; retailers' carload lots, $1.68.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $27; 6 to 12 inches, $26; larger sizes, $24; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $25, f. o. b. New York, in carload lots.

BIRMINGHAM

Water mains: 4-inch, $20.00; 6-inch and up, $22.00. Gas main: $1 per ton higher than water main. Special fittings, $47.50 to $52.50.

Old Material

PITTSBURGH

(Gross Tons Delivered.)

Heavy melting scrap	$12.50 to 12.75
Rerolling rails	14.00 to 14.50
Malleable	11.50 to 11.75
Bundled sheet scrap	8.00 to 8.25
Iron axles	23.00 to 23.50
Old iron rails	15.00 to 15.50
Stove plate	9.00 to 9.25
No. 1 wrought scrap	13.00 to 13.50
Old car wheels	12.50 to 13.00
Low phosphorus	15.00 to 15.50
Machine shop turnings	6.50 to 7.00
No. 1 busheling	11.50 to 12.00
Cast borings	8.00 to 8.25
No. 1 cast scrap	12.25 to 12.50

PHILADELPHIA

Gross tons delivered to consumers' plants in eastern Pennsylvania and western New Jersey:

Old iron rails (nominal)	$17.00 to 17.50
Old steel rails (rerolling)	14.00 to 14.50
No. 1 heavy melting steel	11.50 to 12.00
Old car wheels	12.50 to 13.00
Old iron axles	25.00 to 26.00
Old steel axles (nominal)	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought pipe	11.00 to 11.50
Cast borings	8.00 to 8.50
Machine shop turnings	8.00 to 8.50
Heavy cast (broken)	13.50 to 14.00
Malleable	12.00 to 12.50
Stove plate	9.50 to 10.00
No. 1 forge	10.00 to 10.50
Low phosphorus	15.00 to 15.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Rozbling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg, and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$15.00
Old steel rails (under 3 ft.)	13.00 to 13.50
Old steel rails (over 6 ft.)	11.75 to 12.25
Relaying rails	23.00 to 25.00
Old steel boiler plate	9.00 to 9.50
Malleable iron (railroad)	11.75 to 12.00
Axle turnings	7.50 to 8.00
Steel axles	18.00 to 19.00
Malleable iron (agricultural)	9.00 to 9.50
Heavy steel	11.25 to 11.50
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	7.50 to 8.00

Net Tons

No. 1 R. R. wrought	$11.50 to 12.00
No. 1 busheling	10.00 to 10.50
No. 1 machine cast	11.50 to 12.00
No. 1 dealers' wrought	9.00 to 9.50
Machine shop turnings	5.00
Pipes and flues	7.50 to 8.00
Wrought drillings	5.00
Cast borings	6.00 to 6.50
Stove plate	8.25 to 8.50
Wrought iron arch bars	16.00
Wrought iron piling plate	14.00

CHICAGO

(Delivered in consumers' yards.)

Gross Tons

Old car wheels	$13.00 to 13.50
Old iron rails	13.75 to 14.25
Rerolling rails (5 ft. and over)	12.25 to 12.75
Old steel rails (3 ft. and und.)	11.25 to 11.75
Frogs, switches and guards	10.50 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

Net Tons

No. 1 R. R. wrought	$10.50 to 11.00
No. 2 R. R. wrought	9.50 to 10.00
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.75 to 11.25
Shafting	14.50 to 15.00
Iron car axles	20.00 to 20.50
Steel car axles	16.50 to 17.00
Locomotive tires	12.00 to 12.50
Dealers' forge	8.50 to 9.00
Pipe and flues	7.50 to 8.00
No. 1 cast	10.75 to 11.25
No. 1 busheling	9.00 to 9.50
No. 2 busheling	6.75 to 7.25
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.00 to 12.50
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	5.00 to 5.50
Railroad malleable	10.75 to 11.25
Agricultural malleable	10.00 to 10.50
Angle bars, splices, etc., iron	13.00 to 13.50
Angle bars, steel	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.25

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for eastern Pennsylvania delivery:

Old car wheels (nominal)	$10.50 to 11.00
Heavy steel axles	15.25 to 15.50
Steel shafting	13.50 to 14.00
No. 1 heavy melting steel	9.50 to 9.70
No. 1 R. R. wrought	12.00 to 12.25
Wrought pipe (not galvanized)	9.00 to 9.25
Cast borings	6.00 to 6.50
Machine shop turnings	5.50 to 6.00
Heavy cast	10.75 to 11.00

Stove plate	7.50 to 8.00
Grate bars	6.25 to 6.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

CINCINNATI

Gross Tons

Old iron rails	$11.50 to 12.00
Old steel re-rolling	10.00 to 10.50
Old iron axles	16.00 to 16.50
Heavy melting scrap	9.00 to 9.50
Relaying rails	18.75 to 19.25

Net Tons

Old No. 1 R. R. wrought	$9.00 to 9.50
Bundled sheet scrap	5.00 to 5.50
No. 1 yard wrought	6.75 to 7.25
No. 1 machine cast	9.50 to 10.00
No. 1 busheling	7.00 to 7.50
Stove plate	6.75 to 7.25
Machine shop turnings	5.00 to 5.50
Cast borings	4.50 to 5.25
Heavy turnings	5.25 to 5.75
Mixed cast	7.75 to 8.25
Breakage	5.50 to 6.50
Malleable	7.00 to 7.50

BIRMINGHAM

Old iron axles, (light)	$15.00 to 15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Tram car wheels	10.50 to 11.00
Light cast and stove plate	8.25 to 8.75

BUFFALO

Gross Tons

Heavy melting steel	$11.00 to 11.50
No. 1 R. R. wrought scrap	13.00 to 13.50
No. 1 R. R. and mch. cast scrap	13.00 to 13.50
Old steel axles	17.00 to 17.50
Old iron axles	22.50 to 23.00
Car wheels	13.00 to 13.50
Railroad malleable scrap	12.00 to 12.50
Machine turnings	6.00 to 6.50
Heavy axle turnings	8.00 to 8.75
Cast iron borings	6.25 to 6.75
Low phos. steel scrap	16.50 to 17.00
Old iron rails	15.00 to 15.50
Boiler plate, sheared	12.50 to 13.25
Bundled sheet scrap	8.00 to 8.50
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	10.00 to 10.50
No. 1 busheling scrap	10.50 to 11.00
No. 2 busheling scrap	8.00 to 8.50
Wrought pipe	9.50 to 10.00

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$12.00 to 12.50
Old iron rails	12.00 to 12.50
Re-rolling rails (3 ft. and over)	12.50 to 12.75
Old steel rails (3 ft. and under)	11.00 to 11.50
Light sec. relayers (45 pounds and und.) subject to inspec.	24.00 to 24.50
Relaying rails, subject to inspec.	24.00 to 24.50
Frogs, switches and guards	11.00 to 11.50
No. 1 R. R. heavy melting steel	11.00 to 11.50
Shoveling steel	10.00 to 10.50

Net Tons

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.75 to 10.25
Arch bars and transoms	14.00 to 14.50
Knuckles, couplers, springs	10.00 to 10.50
Shafting	13.50 to 14.00
Steel car axles	15.50 to 16.00
Iron car axles	19.50 to 20.00
Locomotive tires	11.00 to 11.50
Pipe and flues	7.00 to 7.50
Tank iron and cut boilers	7.00 to 7.50
No. 1 cut busheling	9.00 to 9.50
Cast and mixed borings	4.00 to 4.50
Machine shop turnings	5.50 to 6.00
Railroad malleable	9.00 to 9.50
Agricultural, malleable	7.00 to 7.50
Stove plates	7.50 to 8.00
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	9.50 to 10.00

Store Prices

CINCINNATI

Steel bars, 2.00c; iron bars, 1.90c; plates and shapes, 2.10c; sheets, blue annealed No. 10 2.20c to 2.25c; black, No. 28, 2.65c; galvanized, No. 28, 3.75c; cold rolled shafting, round, square, hexagon and flat, 50 off.

CLEVELAND

Steel bars, 2.00c; plates and shapes, 2.10c; iron bars, 2.00c; sheets, No. 16 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.85c; iron bars, 1.85c; hoops, 2.50c; shapes and plates, 1.95c; No. 10 blue annealed sheets, 2.15c, black, No. 28, 2.80c; galvanized, No. 28, 4.00c.

PHILADELPHIA

Steel bars, 2.00c to 2.05c; structural shapes, 2.00c to 2.10c; plates, 2.00c to 2.10c.

NEW YORK

Steel bars, 2.05c; structural shapes, 2.15c; plates, 2.15c.

WRECK VICTIMS

Include Several Connected With Iron and Steel Business.

New York, Sept. 3.—(By wire.)—Several well known in the iron and steel industry met death in the New Haven wreck at North Haven, Conn., Tuesday. Howard T. Martin, Philadelphia, until a year ago general sales manager of the Pennsylvania Steel Co. for 20 years and at the time of his death general manager of the Eveland Engineering Co., Philadelphia, and Frank P. Rutter, vice president and general sales manager of the Scranton Bolt & Nut Co., Scranton, Pa., were among the victims. The wives of both men also were killed. Mr. Rutter was a son-in-law of A. T. Law, president of the Temple Iron Co. Joseph Ravitch, of Ravitch Bros., New York City, was slightly injured.

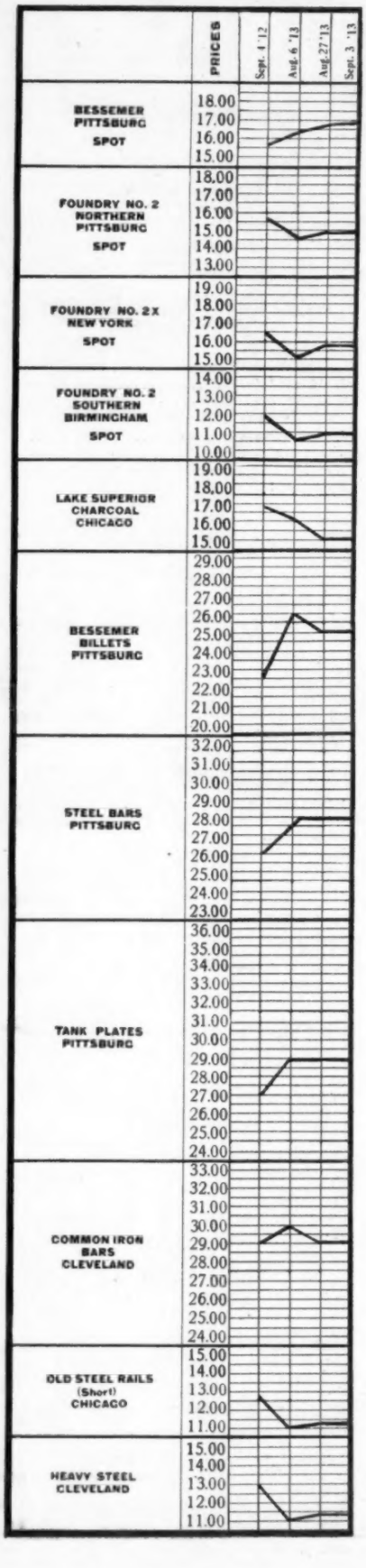
Would Stop Dissolution Suit

Representative Levy, New York, has introduced a resolution directing the attorney general to suspend further proceedings against the Steel Corporation on the ground that the Corporation during the past decade has expended $1,575,000,000 for labor, decreased the cost of producing steel and aided in increasing iron and steel exports.

Inquiry for Basic

St. Louis, Sept. 3.—(By wire.)—An inquiry is out for 2,000 tons of northern basic and 500 tons of car wheel iron.

PRICE CHART



LARGE INCREASE

In Production of Nickel Expected—News From Sudbury District.

The Sudbury nickel district, Ontario, has experienced an important realignment during 1912-13. Last fall a syndicate which it has since developed was organized by Dr. F. S. Pearson, of Montreal and New York, acquired control of the extensive holdings of the Dominion Nickel Copper company (the Booth-O'Brien syndicate). This company continued exploration on the Murray mine and formulated plans for an extensive operation including a smelter at the Murray, and a refining plant using the Hybinette process. Subsequently a company known as the Canadian Nickel Corporation, Ltd., was organized with the following list of officers and directors:

Dr. F. S. Pearson, president of the Brazilian Traction, Light & Power Co., and of many other South American corporations; J. Frater Taylor, vice president and managing director of the Lake Superior Corporation; J. E. McAlister; Benjamin B. Lawrence, consulting engineer, New York; E. R. Wood; Walter Gow, director Brazilian Traction, Light & Power Co.; and Miller Lash, director Mexican Light & Power Co.

The company had a capital of $10,000,000 6 per cent debenture stock and $20,000,000 of common stock. Recently a related new corporation with the same sponsors has been incorporated at Ottawa, known as the British-Canadian Nickel Co. The Canadian Nickel Corporation, by reason of the Booth-O'Brien purchase, secured control of 17,500 acres of partly proven mineral territory in the Sudbury district. This extensive grouping of properties included the Whistle, Joe Lake, Trout Lake and Nickel Lake deposits on the North range; the Murray property, the Elsie and Gertrude properties on the South range and the Victor and Falconbridge groups on the eastern end of the district. The company announced that the proven tonnage was nearly 7,500,000 tons. The tonnage blocked out on the Murray was claimed to be in excess of 5,000,000.

The grade of the company's ore is not authentically announced but it is presumed on an average from 3½ to 4 per cent combined nickel and copper. Subsequent to the purchase, other drilling was done on the Murray mine, for a time nine drills were at work, and the tonnage now developed on this property is variously reported at from 6,000,000 to 10,000,000. At any rate, it is very extensive and the mine is now classed as one of the great mines of the district. The mine formerly belonged to the Vivian estate and was operated by the Vivian company of Swansea for a number of years, but unsuccessfully. It has been abandoned for more than 10 years and during that time has been repeatedly offered at a price of about $125,000, at which price it was purchased by the Booth-O'Brien interest about a year ago. It has been drilled three times, once by the Mond Nickel Co., and rejected. It appears that the main ore body was not directly connected with the outcropping ore bodies and it was discovered only by extensive and fortunate drilling by the present holders.

The announcement that the Canadian Nickel Co. would enter the field on a large scale was made after negotiations for the Booth-O'Brien Co. were concluded. More recently, some developments, the purport of which is not officially announced yet, indicate the possibility that the Mond Nickel Co. and the International Nickel Co. may participate in the exploitation of the extensive tonnage controlled by the new company. At any rate, the plans of operation have been temporarily suspended.

New Smelter

In the meanwhile, the Mond company has completed its new smelter at Conniston and is now treating about 500 tons a day, which will soon be increased to 1,000 tons daily, more than double its tonnage treated formerly at the Victoria mine smelting plant. This company is developing a property known as the Froude, in which about 1,000,000 tons of ore are known to exist and is also extending its exploitation to the Garson and Victoria mines, both of which have produced extensively and which are supposed to still contain large quantities of ore. The same company has also opened up the Kirkwood and North Star mines and is now drilling on the Levack township the extensive property owned by Stobie, Tough & McConnell. The Mond company recently acquired by purchase the Worthington and Blezard mines from the McIntyre and Lockerby estates at Montreal and is now drilling the Worthington mine, located on the Soo railroad, west of Sudbury.

The International Nickel Co., operating as the Canadian Copper Co., is extensively developing the No. 3 or old Froude mine and has readjusted the methods of mining operation at its Creighton mine. Recently the company has undertaken to drill and open up some of its old mines near Copper Cliff and is planning to treat ultimately a tonnage of 10,000 tons daily, which is about three times its present treatment capacity. The bulk of its ore for several years has come from the Creighton mine and had an unusually high nickel content. The ore from the new No. 3 mine will not probably run much over 3½ per cent combined nickel and copper and this lowering of grade will necessitate greater economies in mining and treatment than have heretofore prevailed.

Last year the American Smelting & Refining Co. investigated the district thoroughly and carried on protracted negotiations for some time for some of the important outside properties. The company took some options and did some drilling, but after its failure to acquire the Booth-O'Brien properties, apparently decided that the district did not afford big enough opportunities to justify its proposed operation in nickel. This company, which is dominated by the Guggenheim interests, has once before endeavored to enter the district, but without success. It is understood now that the company is not actively interested in the Sudbury district, although the Guggenheim interests are inclined to go into the nickel camp if an opportunity is afforded. The individual exploitations in the district during this season have been of a minor account and the whole situation seems to await a readjustment of the interests between the three big companies now in the field.

In any event, there will be a large increase in the output of nickel immediately and for several years to come if the present plans of new installation are carried out. If the new company remains independent and enters the field on the scale contemplated, it will, at least, treble the output of nickel.

It is supposed that the new company is financed largely abroad by parties interested in the consumption of nickel, but this has not yet been made public and the real status of the new company in the nickel trade is yet undetermined. At any rate, the developed supply of nickel ore has been increased two or three times within the past two years, and the output is increasing steadily at a very large rate.

Increased business of the Acklin Stamping Co., Toledo, has necessitated the erection of a warehouse and shipping room, of modern construction, thoroughly equipped for the rapid handling of sheet and bar metals. Facilities are provided for storage of about 1,500 tons and this quality of stock will meet demands of customers promptly.

THE IRON TRADE REVIEW

DEVOTED TO THE IRON, STEEL, MACHINERY AND FOUNDRY INDUSTRIES

Published Every Thursday by

The Penton Publishing Company

CLEVELAND

BOSTON	201 Devonshire Street
CHICAGO	1521-23 Lytton Bldg.
CINCINNATI	503 Mercantile Library Bldg.
NEW YORK	503-04 West St. Bldg.
PHILADELPHIA	611 Bulletin Bldg.
PITTSBURGH	2148-49 Oliver Bldg.
WASHINGTON, D. C.	501 Metropolitan Bank Bldg.
BIRMINGHAM, ENG.	Princes Chambers

Copies published three months or more previous to date of current issue, 25 cents each.

All communications relating to changes of advertising copy, discontinuances, etc., must be received ten days prior to the next publishing date.

Subscription, United States and Mexico $4 per year.
Canada $6 and other Foreign Countries $8 a year.

Entered at the Postoffice at Cleveland as Second Class Matter.

Copyright 1913, by the Penton Publishing Co.

Cleveland, September 4, 1913

Our Over-Sea Trade

The proximity of the opening of the Panama canal has somewhat stimulated ship building and Atlantic coast ship builders are reasonably well employed in the construction of tonnage in anticipation of the event. It is a notable circumstance, however, that all of this tonnage is coastwise and the foreign interests that have placed orders with coast yards for new ships have done so for the reason that they may enjoy coastwise privileges with exemption from tolls in passing through the Panama canal.

There is nowhere building in the United States a ship destined for the foreign trade of this country. This is a most lamentable circumstance. When it is considered how vast the foreign trade of the United States is, and when it is further considered how diversified are the arts that contribute to the making of a ship, it is little short of criminal negligence that the country suffers this condition to continue. The foreign trade of the United States last year was well over $3,000,000,000 and the ships that carried these products received about $250,000,000 for doing so. About 10 per cent of this commerce was carried in ships of American register. The balance was carried in ships of foreign register, mainly British. There is no sound reason why at least 50 per cent of this commerce should not be carried in American bottoms, and it would be if public opinion could be quickened on the subject. The United States is hiring the ships of other nations to carry its goods. It is precisely as though a department store engaged the delivery wagons of its competitor to deliver its goods.

The operation of an American ship in the foreign trade of the United States is a difficult thing, but it has been made difficult solely by the fiscal policy of the country which has extended protection to every industry save that of shipping and at the same time has demanded a higher standard of living aboard ship than obtains with other nations. The handicap is wholly artificial and can be removed by legislation.

During the past 10 years about $30,000,000 has been expended in coast ship yards for the construction of ships for the foreign trade of the United States, mainly, however, for West Indian and Central American trade. Under normal conditions the expenditure should have been more nearly $300,000,000 than $30,000,000. A nation is justly entitled to the carriage of one-half of its goods over sea. A great fleet of ships could be operating under the American flag if congress could only be persuaded to give the American merchant marine a square deal. As far as the foreign trade is concerned, the Panama canal will benefit only foreign countries. There are practically no American ships to utilize it.

Triumph as Friend or Enemy?

To what extent business interests have been responsible for the troubles in Mexico probably will never be fully known. "Oil concessions are at the bottom of the entire Mexican turmoil," is the statement attributed to a member of the foreign relations committee of the senate, who have had access to the unpublished results of the United States investigation into the causes of the various insurrections in Mexico. However this may be, President Wilson, in his message to congress, made it clear that he is not working in the interest of any business in Mexico, but for the welfare of the republic which he seeks to pacify. Business men of the United States having capital invested in Mexico, and many people who have no financial interests in that country, will be inclined to resent the urgent advice of the president that all Americans leave Mexico at once, for it would seem at first thought that this great nation ought to be able to protect the lives and property of its citizens wherever they may be. To do so, however, would mean armed intervention in all probability, with greater loss of life and property than can possibly result from a non-intervention policy. In this conclusion a great majority of the American people will concur.

As to the actual facts concerning present conditions in Mexico and the probability of pacification by the Huerta regime, President Wilson asserts that the territory controlled by the provisional authorities has grown smaller while "war and disorder, devastation and confusion, seem to threaten to become the settled fortune of the distracted country." On the other

hand, Senor Gamboa had asserted in his letter to Mr. Lind that the "gross imputation" that no progress has been made toward establishing in the Mexican capital a government worthy of the respect and obedience of the people is unfounded. Gamboa further declared that of 31 states and territories 22 are under the absolute control of the present government, while the southern frontier is at peace and the government has 80,000 men in the field putting down the insurrections. Evidently, President Wilson's information does not harmonize with the Gamboa statements and must be considered more reliable by Americans.

Probably, as the president says, the rejection of the American proposals by the Mexican government was due largely to the belief that the present administration does not represent the people of the United States. Narrowly partisan criticism was responsible for that belief. During the past week, however, Mexico must have been impressed by the hearty support which the American people are giving the administration. When Mexico comes fully to realize that President Wilson is supported by the country and that Mexico, if it persists in its recent policy, will be friendless among the great nations, then will the provisional government be willing to listen to American proposals and, we trust, bring about the fulfillment of the president's hope that "the steadying pressure" of moral force will soon break down the barriers and that "we shall triumph as Mexico's friends sooner than we could triumph as her enemies."

Upsetting Tariff Worship

In the blue funk, into which many prominent business men immediately fall these days whenever they discuss the possible effects of the pending tariff law, it is refreshing to find there are contrary opinions upon this subject held by equally eminent authorities.

Two leading captains of industry, one of them a copper magnate, the other high in his experiences in copper and steel, in a recent discussion, put forth views which, if it is not entirely new, have at least the flavor of originality and deserve careful attention because of their source. These men took the position that the passage of the Underwood bill and the legislation on currency reform would be followed by one of the longest and brightest eras of prosperity this country has ever experienced.

How they arrived at this conclusion is interesting. In the first place, they were willing to grant for the sake of argument that the most uncompromising radicals were in control of the dominant party, and would dictate a legislative program that would be extremely severe in its character. While they were not convinced that this was actually a fact or that the conservative forces were not equally, if not more powerful than the extremists, they were willing to accept the views of many that such a condition does exist at Washington today in order to be able to more clearly illustrate their point.

Their conclusion from these premises, therefore, was that the legislative product to emerge from such hands would be the most severe and radical in its provisions for tariff and banking reform that is likely to be enacted in many years. In other words, it would be diametrically opposed to the conditions which the country has been experiencing in the line for some years and would set the outside mark beyond which future congresses are not likely to go. The country would be obliged completely to adjust itself to the new set of conditions created for it and would thoroughly discount the situation at its worst. All succeeding administrations would not be likely to increase these conditions; if of the same political persuasion as that now in power, the ruling party would not be inclined to be more radical than its predecessor since what the latter had done would be regarded as sound party doctrine. Here at least would be the stability that would come from the non-molestation of fundamental conditions. If of the opposite political faith, the tendency would be in the direction of remedial or counteracting legislation which would be favorable rather than otherwise to the business situation. From a legislative standpoint, there would be nothing seriously to disturb confidence or obstruct the regular flow of trade for some years. The country, furthermore, would be in a fair way of getting down to actualities, not theories, and of having a final demonstration of both sides of some of the greatest problems that have divided business opinion in recent years.

These views as here set forth are far superior in logical reasoning at least to the many apparently snap judgments not infrequently heard these days to the effect that the country is headed for the bow-wows, because old conditions are to be changed. As they are the sincere opinions of business men of large affairs, who have extensive interests at stake, they furnish food for thoughtful reflection.

Municipal Improvements on the Mesabi Range

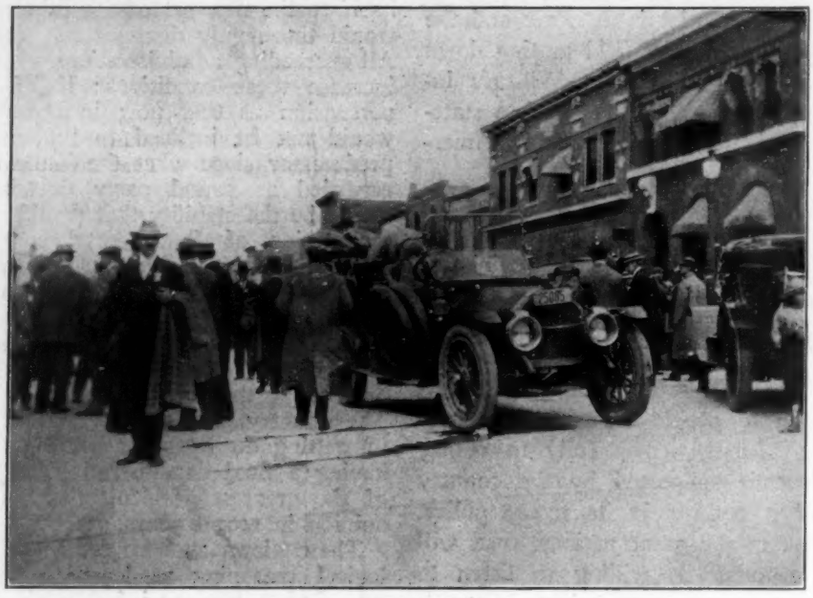
In the early days of its development, the Mesabi iron range was famous for its tough living. The hotels were typical of the frontier, sanitary facilities were unknown, electric lights were considered absurd luxuries and the food served to the venturesome traveler was execrable. Bad as were conditions for the transient, they were scarcely better for the resident. Communication between the various towns depended on uncertain train service and all but impassable roads. The townsites and mine locations were mere scars on the landscape, the schools were poor and the government scarcely existent.

Today these conditions are only a memory. The range towns are justly famous for their schools, their government and their municipal improvements. The point has now been reached where the iron mining communities are ready to acquire not only the necessities, but the refinements of modern civilization and within the past year great progress has been made in further improving social and municipal conditions. The Mesaba Electric Railway, which has now been in operation for six months, has supplied much needed rapid local transportation. Streets are being paved, cluster lights installed and both front and back yards have been put in order. In Hibbing, a rather unattractive townsite is being beautified by parks and gardens. In brief, the collateral benefits of a permanent industrial development are now appearing on the iron ranges.

Successful Meeting of Superior Mining Institute

Activities of the Mesabi Range Fully Inspected—Admirable Arrangements—Safety in Mines and Other Subjects Discussed

During five days of last week 300 members of the Lake Superior Mining Institute, who assembled at Duluth on Aug. 26 for their annual convention, were treated to a living panorama of the mining activities of the Mesabi iron range, which will long remain vivid in the memories of those who were privileged to witness it. The entire sweep of the Mesabi ore district from Aurora on the east to Coleraine on the west was covered. Much of the success of the trip was due to perfect transportation arrangements and to the liberal use of automobiles which permitted a more accurate survey of the territory than would otherwise have been possible. There were but two business meetings, and the professional sessions were subordinated to the sight-seeing and entertainment features.



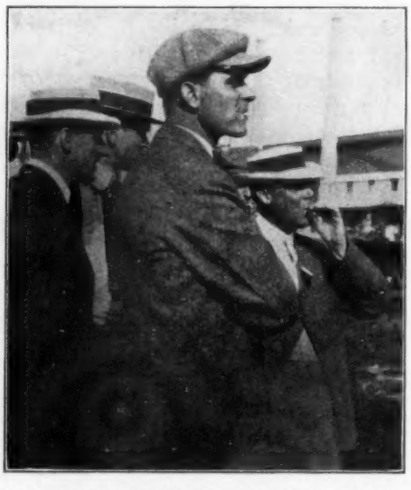
MEMBERS OF THE LAKE SUPERIOR MINING INSTITUTE AT BIWABIK, WHERE THEY STARTED ON THEIR AUTOMOBILE TOUR OVER THE EASTERN MESABI RANGE

Events moved with much greater precision and display of organization than usually accompanies such affairs. The complete program was carried out to a nicety with no hesitation, confusion or delay. This was undoubtedly due to the fact that the details were in charge of some of the ablest executives in the iron mining business. John H. McLean, general manager of the Oliver Iron Mining Co., headed the committee on arrangements, which included nine members no less efficient than their leader. The transportation problem was fittingly delegated to W. A. McGonagle, president of the Duluth, Missabe & Northern railroad. Francis J. Webb, in charge of the Republic Iron & Steel Co.'s interests in Minnesota, as chairman of the entertainment committee, displayed an intimate knowledge of the mining man's taste in amusements, while George A. St. Clair and a committee of 43 iron range veterans were fully equal to their duties as hosts. It is not surprising that men who can mine and deliver over 30,000,000 tons of iron ore annually should show signal ability in pulling off a five-day convention.

J. H. McLEAN, GENERAL MANAGER OF THE OLIVER IRON MINING CO., WAS DEEPLY INTERESTED

As a prelude to the trip over the range, a visit was made to the new plant of the Minnesota Steel Co. at Duluth on Tuesday afternoon. The distance to and from the plant was covered in the steamer Columbia. This gave an opportunity to view Duluth harbor, including the ore docks, and the excursion was a miniature of the life-size moving pictures of the mining country, which were to fill the remainder of the week. At midnight Tuesday two special trains, including 26 sleeping, dining and private cars, pulled out over the Duluth & Iron Range for the ore country. The destination was reached long before the occupants of the cars were astir. The trains were parked until morning and the breakfast hour enlivened by a short run from Aurora to Biwabik.

At the latter point a brass band and 75 automobiles were waiting. The motor cars were contributed by the residents of Hibbing, Eveleth, Virginia and neighboring towns and with very few exceptions they were driven by their owners. Bankers turned amateur chauffers, mine superintendents neglected important opera-



F. J. WEBB, VICE PRESIDENT OF THE INSTITUTE AND PARTY OF FRIENDS INSPECTING THE STEEL PLANT AT DULUTH

tions and merchants deserted their counters that the visitors might fully enjoy the day.

In no way was the perfection of the arrangements more vividly illustrated than in the management of the motor car brigade. The column was led and marshalled by "Billy" West, general superintendent of the Oliver Iron Mining Co. at Hibbing, accompanied by prominent officers of the institute. Every machine was numbered and each one held to its consecutive place in the line. On the night before the start, places in the cars had been assigned by the committee and each member was given a card directing him to the proper machine. In this way all overcrowding and confusion were avoided. Approximately every tenth machine was held in reserve so there would be no delays due to tire trouble or other causes, and the rear was brought up by a specially equipped emergency repair car. Fortunately, the latter was not needed.

At the Leonidas mine, where a stop was made, special cages had been slung in the skipways, affording the visitors an opportunity to inspect the large underground pumping plant. In order to break into the monotony of continual mine inspections, over two hours on Tuesday afternoon were given over to a trip through the saw mills of the Virginia & Rainy Lake Co. at Virginia. This was followed by a ball game and the whole topped off with a dinner tendered by the Elks' and Virginia clubs.

The new high school at Virginia was the scene of the first business session on Tuesday evening.

The important subject of safety in mine operation received its full share of attention, and three papers bearing on different phases of this topic were

W. J. WEST, GENERAL SUPERINTENDENT, OLIVER IRON MINING CO., SEATED AT STEERING WHEEL OF HIS AUTO

AT THE LEFT IS PROF. CHAS. E. VAN BARNEVELD, AUTHOR OF "IRON MINING IN MINNESOTA" AND DIRECTOR OF MINING EXHIBITS AT THE PANAMA-PACIFIC EXPOSITION

presented. E. B. Wilson, of Scranton, Pa., wrote on "Mine Laws, Special Rules and the Prevention of Accidents", Edwin Higgins, district engineer, U. S. Bureau of Mines, discussed "Safety in the Mines of the Lake Superior Iron Ranges", published in THE IRON TRADE REVIEW of Aug. 28.

The committee on prevention of accidents, appointed at the 1912 meeting of the institute, submitted a complete report. Mr. Wilson's paper gives information regarding the mine laws of various states, the qualifications of state mining inspectors and also makes reference to the uniform metal mining law proposed by the American Mining Congress. Mr. Higgins discussed the practical efficiency of mine safety appliances in some detail, taking up in turn the subjects of timbering, handling explosives, general conditions, fire prevention, machinery, tools and appliances, rules and regulations and inspection.

Accident Prevention

The institute committee on the prevention of accidents, of which J. E. Jopling, of the Cleveland-Cliffs Iron Co., Ishpeming, is chairman, submitted a report embodying the following recommendations:

That the reports of the county mine inspectors of Michigan, Wisconsin and Minnesota be standardized; that the reports should cover the calendar year, and that they should include fatal and serious accidents of all mine employes whether surface or underground. In the judgment of the committee these accidents should be classified according to a uniform system and recorded upon a uniform blank.

That investigations be made leading to a uniform classification of accidents for mines in the Lake Superior district.

That blank forms used for reports to show the carrying out of safety rules be collected, these blank forms to be only such as are used by employes in various departments of the mining companies for their information.

That more definite action should be taken in the matter of contagious diseases in the different localities, in the form of a rigid quarantine to be established by the health officer.

That investigations be made to find out what is being done in the matter of physical examination of employes by employers of labor.

That suggestions be made as to the dissemination of the rules for the prevention of accidents among employes.

A study of the printed rules of the various iron mining companies showed a wide divergence in the classification of accidents, for which reason the committee found it impossible to frame a uniform code of safety rules and further study of this subject was recommended.

Some interesting comparisons of mining costs in Alabama and in the Lake Superior district were embodied in a paper read by Dwight E. Woodbridge, of Duluth, and published in THE IRON TRADE REVIEW of Aug. 28.

"Sanitation For Mine Locations," by W. H. Moulton, of the Cleveland-Cliffs Iron Co., Ishpeming, and a paper on the Winona copper stamp mill, by R. B. Seeber, were read by title. An exhaustive paper entitled "Mining Methods on the Mesabi Iron Range," by a committee consisting of Willard Bayless, E. D. M'Neil and J. S. Lutes, includes much practical information. Prof. Chas. E. Van Barneveld made a statement in regard to the mining

C. D. COLE, OF GOGEBIC RANGE, AND J. W. WHITNEY, ON DECK OF STEAMER

features of the exposition to be held in San Francisco in 1915.

Promptly at 8 a. m., on Thursday, the automobile column was again in readiness and the day was devoted to an inspection of the many large open-pit operations between Virginia and Hibbing. A buffet lunch, where fellow owner rubbed elbows with shift boss, was served at Chisholm by the "Ladies' Aid Society". In the evening at Hibbing, a special entertainment, including a boxing match, added spice to the occasion.

Second Business Meeting

Friday found the two special trains at the western end of the district, and in the evening at Coleraine the second business meeting took place. Motion pictures of Mesabi range operations, reviewing what the members of the Institute had seen during the week in reality, preceded the set program.

A paper on "The Application of Mining Machines to Underground Mining on the Mesabi Range", by H. E. Martin and W. J. Kaiser, brought out some very interesting facts. Machines have not heretofore been used in underground Minnesota operations.

A complete description of the methods adopted in relining No. 2 Hamilton shaft with reinforced dividers, end plates and poured concrete walls was embodied in a paper presented by S. W. Tarr, engineer of construction of the Oliver Iron Mining Co., Duluth. This contribution was profusely illustrated with detailed drawings.

"Wash Ores in Western Mesabi and the Coleraine Washing Plant", by John U. Sebenius, "Suggestions for the Application of Efficiency Methods to Mining", by C. M. Leonard, and "Concentrating at the Madrid Mine", by Benedict Crowell, were among the other papers read on Friday evening.

On Saturday morning the excursion program was concluded by a trip over the large washing plant, operated by the Oliver Iron Mining Co., at Coleraine. This plant, situated on the shores of Trout Lake, and heretofore fully described in THE IRON TRADE REVIEW.

As usual, the annual elections, which took place at Coleraine on Friday evening, were unanimous. The new officers are as follows: President, one year, W. H. Johnston; vice president, two years, Luther C. Brewer, Chas. E. Lawrence and A. J. Kruse; managers, two years, W. A. Siebenthal and J. S. Lutes, one year, to fill unexpired term, S. R. Elliot; treasurer, E. W. Hopkins; secretary, A. J. Yungbluth. Messrs. Hopkins and Yungbluth were re-elected in recognition of their extraordinary services in behalf of the Institute. The next convention will be held on the Marquette range and the arrangements will be under the supervision of President Johnston, of Ishpeming, who is general superintendent of the Marquette district of the Oliver Iron Mining Co.

SHOWS INCREASE

Annual Report of Dominion Steel Corporation Made Public.

The annual report of the Dominion Steel Corporation, Ltd., submitted by directors to stockholders at the annual meeting, shows net earnings for the year ending March 31, 1913, were $4,714,057.77. Directors commented on the showing as follows:

"In view of the conditions that prevailed during the past year, your directors regard the result as encouraging. The prices received for steel products in the earlier part of the year were low; the costs and output were affected adversely by the pressure to complete the new plant, and, as before, a considerable part of the product had to be in forms of finished steel which, owing to the condition of the tariff, were unprofitable. In addition, while part of the expenditure of new capital on your properties has increased fixed charges, it has not yet produced the increased earning power which you are entitled to expect.

"The tariff remains unchanged, but the other disadvantageous conditions have passed, or are passing away. The acute depression in iron and steel prices, resulting from conditions which prevailed in the United States, was severely felt by the company during the first half of the year, notwithstanding the heavy demand for these products, but the conditions in this respect have greatly improved and better prices are now being obtained.

"In the financial year upon which we have now entered, your business will have the advantage of larger outputs, of ability to produce more profitable forms of finished steel by means of the new mills, and, it is hoped, of lower costs.

"The additions to the steel plant have been more extensive and more costly than the early estimates, and much larger amounts are found to be absorbed in working capital, owing to the enlargement of all branches of your business. Your directors have sold at a satisfactory price, £200,000, of the 5 per cent consolidated mortgage bonds of the steel company and have under consideration the issue of a further moderate amount of securities to provide for these matters.

"It is impossible with such properties as yours to fix any limit to the growth of the plants, but, subject to unforeseen developments, it is proposed that for some time to come the energies of the staff shall be devoted to the development of the steel plant as now completed, and that no further extensions shall be undertaken until the existing plant has been brought to the highest efficiency. The equipment of the coal company must not only be maintained, but steadily increased to meet the growing requirements of your customers. A large part of this your directors expect to provide for out of reserves and surplus earnings."

Figures of production show a fair increase over last year. The production in tons was:

Coal company.	1913.	1912.
Cape Breton collieries...	4,640,940	4,063,395
Cumberland collieries ...	412,220	342,868
Total	5,053,160	4,406,263

Steel company.	1913.	1912.
Ore mined, Wabana.....	757,003	602,168
Pig iron	321,020	290,588
Steel ingots	343,251	335.533
Blooms and billets.....	49,132	43,950
Rails	174,802	153,498
Rods	53,323	70,633
Bars, wire nails, etc.....	10,778	.....

The capital expenditure of the companies for the year were $4,939,866.25, of which $2,456,026.27 was spent for new collieries and other improvements in connection with the coal business and $2,483,839.98 on the steel company's plant mines and quarries. Earnings of the combined companies supplied $1,000,000 of these expenditures.

The financial report is as follows:

	1913.	Increase.
Net earnings.....	$4,714,057.77	$778,876.41
Sink. fund. & dep.	1,009,650.61	129,007.81
	$3,704,407.16	$649,868.60
Int. on bonds and dis. on bonds sold	1,331,739.59	112,370.91
Net earnings	$2,372,667.57	$537,497.71
Bal. Apr. 1, 1912..	784,945.98	49,965.88
	$3,157.613.55	$587,463.57
Dividends	2,274,601.00	489,397.00
Bal. Mar. 31, 1913	$883,012.55	$98,066.57

Officers of the company re-elected by the board of directors are:

President—J. H. Plummer.

Vice President—Sir William C. Van Horne.

Secretary and Treasurer—C. S. Cameron.

Assistant Secretary and Treasurer—W. A. Doig.

Executive Committee—Mr. Plummer, Mr. Van Horne, J. R. Wilson, Frederic Nichols, Col. Sir Henry M. Pellatt, C. V. O.

The Reynolds Pattern & Machine Co., Moline, Ill., has increased its directorate from three to five.

Renewal of Agitation About Armor Plate Plant

To be Built by the Government—Secretary Daniels Seeks to Bring About Competition—Asks About Costs—Senator Sherman's Proposal

Washington, Sept. 2.—Events of the past week point sharply toward congressional action at the coming regular session to thresh out one way or another the question of the government erecting and operating its own armor plate plant. This subject, which has been fought back and forth almost since the beginning of armor plate manufacture in the United States, without any concrete results, promises to find a settlement at that session.

While Secretary of the Navy Daniels is the real moving spirit in the proposed legislation, it is not confined to administration or party lines.

Bringing the matter to a definite issue was the opening last Wednesday of bids by the secretary for the armor plate for battleship No. 39, now building at the New York navy yard. When he found those bids, submitted by the three armor makers of the country, the Carnegie Steel Co., the Bethlehem Steel Co., and the Midvale Steel Co., were identical on all three classes, Class A1, 6,839 tons, Class A2, turret, 900 tons, and Class B, 252 tons, Secretary Daniels plainly showed irritation, and issued a statement, in which he said it is more apparent than ever that if the government is to secure the benefits resulting from competition in the supply of armor additional, responsible and adequate sources of supply must be established, and continued by saying "it looks as though the only hope for relief from exorbitant prices is for the government to establish an armor plant."

The following day he rejected the bids, which were $454 for Class A1; $518 for Class A, turret, and $496 for Class B. Also on that day he had a personal conference with W. H. Balsinger, J. B. King and E. O'C. Acker, representing, respectively, the Carnegie, the Bethlehem and the Midvale companies.

"Process of Telepathy"

He had called the representatives to Washington, he said, to learn "from each by what process of mental telepathy they arrived at the identical figures in their bids."

All three representatives told Mr. Daniels that the navy department alone was responsible for the absence of competition, and each said he did not know what the bids of the others were until the bids were opened. They emphatically told the Secretary that they did not combine to make their bids the same, and that when they took the required oath that they had not entered into any combination in making their bids they acted in good faith.

It was explained to the secretary that the navy department had established on its own initiative the policy which eliminated competition. This, it was pointed out, consisted of the dividing of the tonnages equally among the three bidders on the basis of the lowest bid. Because of this system, the secretary was told, the companies should not be the object of criticism which has been heaped upon them in such a large abundance.

Wants Costs

After notifying the representatives of the rejection of their bids, the secretary asked them to submit detailed statements to him showing the cost of manufacture of armor per ton, the cost of the raw material, labor and plant, specifying items entering into the cost of the various kinds of plate and the separate cost of each process.

When this rather remarkable request has been complied with, Mr. Daniels said he would be willing to give a hearing to the heads of the three companies and that he may visit each of the plants.

Before these bids were opened the secretary received from the American-British Mfg. Co. a letter, saying the company had a desire to bid, but that there was not time enough before the opening of the bids to justify it in putting in any. Secretary Daniels said he is considering the idea of extending the time for the manufacture of the armor in order to allow other possible competitors, which he hopes will enter the field. He said the armor for battleship No. 39 will not be needed for one year. Occasion was taken by the secretary to say that, while no assurances were given for actual competitive bidding, he felt confident a satisfactory adjustment of the armor plate situation will ultimately be brought about. It would be gratifying to him and the administration, he added, if this could be done without the government having to build its own plant.

In addition to the tonnages involved in Class A1, Class A, turret, and Class B, there were also the following in these bids: Class C (steel), 61 tons, $548 for the three armor-making companies and $448 for the Carbon Steel Co.; Class C (bronze), two tons, $1,875, for the three armor-making companies, the only bidders, and 708 tons of hollow forgings, $708, the bid of the Bethlehem and Midvale companies. All this tonnage was rejected along with the armor plate, although the secretary expressed gratification at the $100 reduction shown in the bid of the Carbon company on Class C (steel).

The secretary has insisted that reports from practical men show armor plate can be made at a much less figure than the charge by the three armor makers indicates, and places the cost of making Class A1 at from $225 to $250, the bid on which, he says, should not be over $300.

Contracts for structural material and castings for the battleship which have been awarded, involved 14,305 tons. The steel castings, 343 tons, were awarded to the American Steel Foundries, the lowest bidders, at $92 per ton. The other tonnage comprises principally steel plates and shapes. It has been divided among the Carbon Steel Co., the Carnegie Steel Co., Pittsburgh, and the J. B. Kendall Co., Washington.

The entire award amounts to $1,269,502.67. The armor contract, based upon the bids submitted, would aggregate roughly $3,000,000.

Claims Saving

The American Steel Foundries award was $31,556, its competitors and their bids being as follows: The Baldt Steel Co., $35,956.69; the Bethlehem Steel Co., $38,416, and the Pennsylvania Steel Casting & Machine Co., $49,940.80. The secretary, in commenting on this contract, said his policy of insisting upon real competitive bidding has resulted in a saving of approximately 30 per cent on prices paid in 1910, for practically identical material purchased for the battleship New York. The price then paid, he said, was $134 a ton, as against $92, the price now bid.

The total award to the Carbon Steel Co. included 3,900 tons of spe-

cial treatment steel plates, of which 3,417 tons are from ¾ inch to 1½ inches thick, and weighing from 30 to 60 pounds per square foot, and 483 tons of special treatment plates of from 2 to 4½ inches thick and weighing from 80 to 180 pounds to the square foot. This latter tonnage was awarded on an alternate bid. The remainder of the Carbon award, amounting to 4,270 tons in all, were 370 tons of high tensile steel plates, at $41.668 per ton, or an aggregate of $15,415.68. The entire award to the Carbon company totaled $744,871.73, the special treatment plate award, $187.04 per ton in both bids, being $729,456.05.

The entire award to the Carnegie company involved 6,746 tons, amounting in all to $234,987.04. The principal part of this material consists of 6,285 tons of medium class steel plates, at $34.50 per ton, and 250 tons of flat bars at the same figure. There are also 50 tons of sheet steel at $47.26, 15 tons of galvanized sheet steel at $59.58, and 10 tons of galvanized sheet steel at $68.54. The sheet steel tonnage is to be made by the American Sheet & Tin Plate Co.

An aggregate of $258,087.90 is represented in the 2,946 tons awarded to J. B. Kendall Co. Of this 2,170 tons are medium class steel at $35.75, and 700 tons of steel channels at $36.06. In addition there are 28 tons of galvanized sheet steel at prices ranging from $59.50 to $69.50, making a total of $176,000; eight tons of corrugated galvanized sheet steel at $68, totaling $544, and 40 tons of steel beams at $36.06, amounting to $1,442.40. Of the Kendall award the McCullough Iron Co., Wilmington, Del., will manufacture the 36 tons of sheet steel, while the Jones & Laughlin Steel Co., Pittsburgh, will make the remainder of the material.

Secretary Pleased

Secretary Daniels was also pleased with the outcome of this entire contract, stating that a larger number of bidders were obtained on this material than were ever before obtained for similar material for previous vessels built by the government. The consequent saving in cost, according to his estimate, varied from 3 per cent on steel shapes, bars, etc., to 8½ per cent on structural medium steel plates, and 34 per cent on special steel plates.

Entering into the contract on the special treatment steel plates is a very interesting story, one which was verified by Secretary Daniels when he was asked about it by a representative of THE IRON TRADE REVIEW. Investigation showed that the Carnegie Steel Co. submitted the lowest figures on 3,417 tons in the first of the two sets of bids opened for the 3,900 tons of special treatment steel plates, its competitor and later successful bidder, the Carbon Steel Co., having in the first bid put in a figure which was a little more than $4 per ton higher than the Carnegie bid. The Carnegie bid was the same both times, $221.98. The Carbon bid the first time was $226.24. The second time it was reduced to $187.04, the same figure it also submitted in the second bid for the remaining 483 tons of special treatment plates. The Carnegie bid for the latter both times was $267.19.

Denies Report

Secretary Daniels, when he said it was true that the first bid had been thrown out, was asked if he had been requested to reopen the bids because he had been told a better price could be made.

"No, I would not say it in that way," said the secretary, "but I was convinced that, if a bidder had reduced its figure on other material below previous bids, as the Carnegie company did on battleship No. 39, I could get a better price on this contract. As a result, a second set of bids was opened and the Carbon company reduced its figure and was awarded the contract."

Crowding upon the rejection of the bids on armor, and events marking the contracts, Representative Britten, Republican, of Illinois, introduced last Friday in the house a bill for the immediate appropriation of $7,000,000 for the construction of an armor plate plant. Mr. Britten, ranking minority member of the house naval affairs committee, some time ago introduced a bill which carried largely the same provisions and which has been reported in these columns. Representative Gregg, Democrat, of Texas, offered on the same day a resolution calling for the creation of a special committee of five members of the house to investigate the government's contracts for armor plate and rough gun forgings. Representative Britten's bill provides for the selection of a site for the proposed plant by a board consisting of seven members, three ranking naval officers to be appointed by the secretary of the navy, two senators and two representatives. Construction of the plant would begin within six months after the bill passes. Congressman Britten announced that he is preparing to take up with Senator Sherman, Republican, of Illinois, the advisability of changing the Underwood-Simmons tariff bill so as to admit armor plate free of duty.

When Mr. Britten made this suggestion it naturally became a matter of speculation just how Senator Sherman would be able to persuade the Democrats to change the provisions in the bill, in view of the stubborn opposition made by Democrats, successfully, too, when it comes to changing the bill. Changes have been decidedly limited, and those acted upon at the suggestion of Republicans have been of a minor character. It is further interesting to try to understand what it would avail the government if armor plate were free listed if the contention of a cabinet member, Secretary Daniels, were to hold true. Only a day or so before Congressman Britten made his statement proposing free armor in the tariff bill, Secretary Daniels said a world-wide understanding exists among armor makers not to compete with each other in their respective countries. Going further, it is well known that, when the government imports an article direct for its own use, as would be the case with armor plate, it pays no duty. When bought through a contractor, it does pay duty, but this is only a matter of taking the money out of one pocket and putting it into another. Further, there would have to be a change made in the law, which provides that the government shall purchase armor of the best grade of domestic manufacture. And, finally foreign prices are higher than domestic prices, while the superiority of the armor made in this country is acknowledged generally.

Protest Against Ore Rate

Washington, Sept. 2.—Complaints of the Wheeling Steel & Iron Co., Wheeling, W. Va., and the Pittsburgh Steel Co., Pittsburgh, were formally filed Saturday with the secretary of the Interstate Commerce Commission. As has been detailed in these columns, these complaints protest against the new 88c direct ore rate from lower Lake Erie ports to Pittsburgh and Wheeling. Ellis & Donaldson, Washington law firm, appear as counsel for both companies, and hope to get an early hearing in the cases.

The Wagner Electric Mfg. Co., St. Louis, has opened a store and service department for maintenance of its automobile starters at 1253 Woodward avenue, Detroit, and will have the Detroit office at the same location, removing from the Ford building.

NEW BUSINESS

The machine tool trade of the country contented itself with marking time during the past week. Few inquiries of size appeared, but the beginning of September finds dealers more optimistic regarding the future, as the end of the vacation period is expected to bring out delayed business.

In the New York machinery trade the estimated business done in August falls considerably below that of any month of the current year. While the fact is mitigated to some extent by the quiet trade conditions characteristic of this season dealers are not inclined to attribute the dearth of business entirely to that factor. Under normal conditions, a great many manufacturing interests are active buyers of machinery during the summer months for replacements found necessary while overhauling their plants preparatory to resuming active operations in the autumn. That less than a normal amount of such orders has been received indicates a disposition to go slow until something more definite is known regarding the effect pending legislation is going to have on general business. Most sellers are of the opinion that no material improvement will develop before November. Recent business in machine tools has been limited to orders for one or two machines, with rare exceptions. Other mechanical apparatus has been proportionately quiet. Local dealers have submitted bids on a small list of shop equipment sent out by the Friction Pulley & Machine Co., Hudson Falls, N. Y., which is expected to be bought soon.

In Pittsburgh, developments of interest are reflected by the market for machine tools or heavy rolling mill machinery. Equipment dealers say demand for single tools continues fairly heavy, but buyers do not appear interested in placing large orders at this time. Improvement in general conditions is expected to feature the trade in September. Manufacturers of heavy machinery and equipment are well filled with orders, and contemplated extensions and additions will bring out a number of interesting inquiries if present plans materialize.

In Cleveland, the machine tool market remains quiet, but the new month opens with dealers feeling more cheerful relative to future business. The Lake Shore & Michigan Southern railroad has sent out an inquiry for 10 wood-working machines, the expected appearance of which was announced some time ago. The machine tool market has been dull for several months and any change will be necessarily one for the better. The end of the vacation period and the approach of a settlement of the tariff issue is expected to have a good effect.

In Philadelphia, there has been a fair amount of activity in the machinery market the last week, and inquiries which have been received by the dealers during the past few days indicate that there will be a decided improvement in demand before long. The largest inquiries now out involve six and ten machine tools, respectively; both were put out by local manufacturers. There are also current a number of smaller inquiries. Some second hand machinery has been sold in this market the last few days, but this branch is still dull. A local dealer has submitted bids on the entire machinery of a plant which is being dismantled in Baltimore.

ALABAMA

RUSSELLVILLE. — The Sloss-Sheffield Steel & Iron Co. is building a big modern pumping station here.

ARKANSAS

LITTLE ROCK.—The Dixie Power Co. has increased its capitalization from $10,000 to $15,000. It will build a hydro-electric power plant.

CALIFORNIA

LOS ANGELES.—Reese Llewellyn, president of the Llewellyn Iron Works, Los Angeles, announces the plant will be removed to Torrance in October. The new plant will have a site of 25 acres and will cost $750,000. It will be especially equipped for structural work.

CONNECTICUT

BRIDGEPORT.—The Gaynor Mfg. Co. is planning an addition.

BRIDGEPORT.—The Bridgeport Foundry & Machine Co. has been incorporated; $30,000; B. F. Evans, J. C. Land, Norristown, Pa., J. J. Murphy, Bridgeport, and others.

DERBY.—The Robert N. Bassett Co. has obtained control of the Worcester Metal Goods Co., formerly controlled by Edwin and Earle Brown. Henry J. Stewart will manage the business.

HARTFORD.—The Mount Carmel Brass Foundry Works, Inc., has filed application for incorporation with $50,000 capitalization.

SOUTH NORWALK. — The Coe-Roscoe Mfg. Co. is building a wire mill here.

WATERBURY.—Work has begun on the addition to the buildings of the American Silver Co. It is to be 40 x 60 feet, three stories.

DELAWARE

WILMINGTON.—The Bavarian Brewing Co. is building a $40,000 addition.

DISTRICT OF COLUMBIA

WASHINGTON.—The Washington Electric Co., Washington, organized to manufacture and deal in electrical machinery and appliances, has been incorporated with a capital of $1,000, divided into 100 shares of the par value of $10 each. The trustees are Harluf A. Petersen, J. H. Petersen and Walter Trouland.

IDAHO

KELLOGG.—Sanitary sewer contract has been awarded to Parrott Brothers Co., Baker, Ore., at $20,400.

KOOSKIA.—Citizens have voted $10,500 in bonds for waterworks system.

WALLACE.—The National Copper Mining Co. is preparing to install a 500-ton mill in its mine near Mullan, and will build an electric railway between the mine and concentrator. Chas. McKinnis is manager.

WHITEBIRD.—Hadhorn mill in the Deer Creek section, burned, will be rebuilt.

ILLINOIS

BELLEVILLE.—The Superior Foundry Co. has increased its capitalization from $5,000 to $8,000.

CHICAGO.—The Columbia Wire Co. has dissolved.

CHICAGO.—Macomb Sheet Metal Works increased capital from $5,000 to $50,000.

CHICAGO.—The Henderson Motor Co. has been incorporated; $1,000; Frank L. Childs, H. C. Peterson, D. V. Markin.

CHICAGO.—The H. & F. Mfg. Co. has been incorporated; $2,000; August Wicklund, Harry A. Fleck, M. W. Haveney.

CHICAGO.—The Middle States Coal & Coke Co. has been incorporated; $10,000; George N. Beek, William G. Beek, F. D. Brenner.

CHICAGO.—Charleston Foundry Co. has changed its name to Chicago Stove & Range Co. Capital increased from $25,000 to $105,000.

PEORIA.—The Seltzer & Sinclair Railway Appliance Co. has been incorporated; $15,000; C. M. Seltzer.

SPRINGFIELD.—Foster Sheet Metal Co. has been incorporated; $10,000; John J.

Foster, William J. Foster, Frank M. McGowan.

INDIANA

EVANSVILLE.—The Evansville Brewing Association has awarded the Scarborough-Davies Co. a contract for building bottling plant to cost $300,000.

FT. WAYNE.—Evansville Railway Co. has asked public utilities commission for right to issue $273,000 in bonds for improving Evansville, Ind., street car lines.

HAMMOND.—The Hammond Machine & Forge Co. has reduced its common stock from $25,000 to $9,000 and has issued $16,000 in preferred stock.

INDIANAPOLIS.—The Irvington Ice Co. has been incorporated; $50,000; Frank B. Davenport, Thomas C. Howe and others, to manufacture ice.

LAWRENCE.—Hamilton, O., and Dearborn, Ind., county commissioners gave contract for White river bridge superstructure to Oregon Bridge Co. at $29,000, and C. H. Glandorf Co. for substructure at $30,000.

MARION.—The Atlas Foundry is building an extension to its plant at Twenty-eighth and Branson streets.

MARION.—The Marion Chair Co. has been incorporated; $40,000; will build factory in the near future. R. J. Spencer, William H. Charles and others are interested.

MARION.—The Central Machine & Foundry Co. has started work on an addition to its plant on West Fourteenth street. The new addition will be of brick, 80 x 157 feet.

NEW ALBANY.—The Wood Mosaic Co. has decided definitely to rebuild its flooring and veneer plant, and will buy equipment at once. W. A. McLean is general manager.

VINCENNES.—The Supreme Mfg. Co. has sold its plant to George L. Ryan.

KANSAS

KANSAS CITY.—A site has been bought by the Thomas Railway Track Appliance Co. for a $37,000 plant.

KANSAS CITY.—W. H. Ralton has bought the Fredonia Iron Works and will consolidate it with the Structural Iron Works at Fredonia.

WICHITA.—The Minneapolis Steel & Machinery Co., Minneapolis, has moved its branch house at Lincoln, Neb., to this city.

KENTUCKY

LOUISVILLE.—The plant of the Wood Mosaic Flooring Co., recently burned with $250,000 loss, is to be rebuilt.

LOUISVILLE.—The Rindt Co., which will operate a foundry, has filed articles of incorporation; capital $30,000.

MARYLAND

BALTIMORE.—The S. B. Sexton Stove Co. shortly will build warehouse, 67 x 120 feet, two stories, iron, steel and brick, on concrete foundation.

HAGERSTOWN.—The Pangborn Corporation has been incorporated; $50,000; sand blast machinery.

MASSACHUSETTS

ADAMS.—The Renfrew Mfg. Co. is to build two mills, one 175 x 200 feet, two stories, and the other 70 x 140 feet, one story.

BOSTON.—The S. S. Shepard Dry Battery Co. has been incorporated; $10,000. F. D. Harper, president.

BOSTON.—Greene Mfg. Co., machinery and tools, has been incorporated; $5,000. W. E. Greene, president.

BOSTON.—Directors of the port are to build a $3,000,000 dry dock. It will be 1,200 x 35 x 150 feet.

LAWRENCE.—The Greenwood Mfg. Co. has been incorporated; $10,000; Percival Dove, Oliver P. Green.

LAWRENCE.—The Lawrence Gas Generator Co. has been incorporated; $10,000. J. P. Mahoney, president.

NEW BEDFORD. — City water board awarded contract for 1,250 water meters to the Hersey Mfg. Co., Boston.

WORCESTER.—The Robert L. Whipple Co. has taken a contract to build a 200,000-gallon reservoir and pipe lines at Fort Strong, Boston harbor, for the United States government. The reservoir is to be of reinforced concrete and the pipe lines will be 4-inch and 8-inch cast iron.

MICHIGAN

DETROIT.—An addition is to be built to the works of the Swedish Steel Co.

DETROIT.—Cameron Wheel Co. incorporated; $25,000; A. A. Leslie, F. F. Cameron.

GRAND RAPIDS.—Cowell Tool & Supply Co. has been incorporated; $15,000; Charles E. Richmond, 326 Woodmere avenue, Grand Rapids.

MARQUETTE.—The Geo. B. Swift Co., Chicago, will have completed its contract for building the South Shore round house about Sept. 10. The 75-foot turn table has been placed. Contractors Cowles & McDowell, Chicago, are completing the installation of the boilers and the heating system. A large part of the machinery and equipment is now being shipped to St. Ignace by A. J. Porter, general manager, who will have charge of building of another round house for the South Shore Railroad Co. there.

PORT HURON.—Road commissioners of St Clair county have decided on route for proposed state road.

MINNESOTA

FAIRMONT.—Business men here plan to issue $50,000 in bonds for the Fairmont Machine Co., if the company will locate here

MISSOURI

INDEPENDENCE.—Fire caused $100,000 damage at the works of the American Scale Co.

KANSAS CITY.—The Allen Stamp, Seal & Mfg. Co. has been incorporated; $12,600; George Hanlen, Edward Allen, Richard Henry.

ST. JOSEPH.—Holliday Motor Car Co. has increased its capitalization from $10,000 to $15,000.

ST. LOUIS.—Irving-Pitt Mfg. Co. has increased its capital from $30,000 to $1,200,000.

ST. LOUIS.—The Columbia Quarry Co. has increased its capitalization from $60,000 to $90,000.

ST. LOUIS. — The Monsanto Chemical Works has increased its capitalization from $100,000 to $250,000.

ST. LOUIS.—The National Enameling & Stamping Co. has started its new factory on half force, the remainder to begin work Sept. 15. The company has orders to keep it operating in full until July.

MONTANA

CONRAD.—W. R. Mowery, of Great Falls, has prepared plans for a flax mill here. Thomas Couch and others, of Great Falls, are interested.

HAVRE.—The Great Falls Iron Works, Great Falls, has been awarded contract for posts in districts 58 and 59 at $21,750.

HELENA.—Charters have been filed for the Boston & Montana Development Co., capitalized at $15,000,000, and the Butte, Wisdom & Pacific Railway. The development company will finance the railroad company's proposed line from Butte to Wisdom. Lieut. Governor W. R. Allen, Montana, is president of both companies.

MULLAN.—The Hunter Co. plans building a 1,000-ton ore concentrating and stamping mill to replace its 300-ton mill.

TOWNSEND.—Bids will be requested at once for the first unit of plant for the Inter-Mountain Milling Co., consisting of mill, elevator and warehouse. W. L. Cronk is the local representative.

NEW JERSEY

HARRISON.—The Hyatt Roller Bearing Co. has bought site adjoining its plant for additions.

NEW YORK

BELMONT.—The Rogers Machine Tool Co. has been incorporated; $50,000; D. H. Rogers, D. B. Rogers, F. S. Rogers, Alfred, N. Y.

BROOKLYN. — Atlantic Metal Furniture Mfg. Co., Inc., has incorporated to make metal furniture; $10,000; by Benjamin Lipshitz, 442 Linden street, Brooklyn; John Heller, 846 DeKalb avenue, Brooklyn; Tillie Beckstein, 262 Main street, Norwich, Conn.

BROOKLYN.—The Boorum & Peace Co., Front street and Hudson avenue, have let the general contract to the Turner Construction Co., 11 Broadway, Manhattan, for a manufacturing building to be seven-stories, and 100 x 100 feet.

DUNKIRK.—Motor & Mfg. Works Co. will build two-story factory, 67 x 140 feet.

ELMIRA.—A small fire occurred recently at the works of the Elmira Foundry & Machine Co.

JAMESTOWN.—The Falconer Iron Works, conducted as a co-partnership by Gardner Gilbert and C. L. Klock, has been incorporated.

MANHATTAN. — The Liverani-Lombardi Motor Co., Inc., hydro-carbon motors, has been incorporated; $20,000; Arthur H. Marr, Francesco Lombardi, Joseph Liverani, 321 West Forty-seventh street, New York.

MANHATTAN.—The Ozias National Selling Corporation has been incorporated for general manufacturing business; $25,000; Blake Ozias, James L. Garver and A. E. Carpenter, 1476 Broadway, New York.

NEW YORK CITY.—Plans have been filed for a $95,000 five-story brick factory for the Queensboro Bridge Loft Corporation.

NEW YORK CITY.—Dock & Pier Construction Co., Inc., has been incorporated; $50,000; Charles A. Winter, Rahway, N. J.

NEW YORK CITY.—Rotor Vacuum Cleaner Co. has been incorporated; $15,000; Edward H. Wosiski, 30 Bradhurst avenue.

NEW YORK CITY.—McConnell Coal & Ice Mfg. Co. has been incorporated; $200,000; Jas. McConnell, 330 Arlington avenue, Jersey City.

NEW YORK CITY.—The Hobart Mfg. Co., Troy, O., motor-driven machinery, capital $1,600,000, has been authorized to do business in this state. Representative, Albert Woodruff Gray, 78 Wall street, New York.

NEW YORK CITY.—Ballinger & Perrot, architects, 1328 Broadway, are making plans for the large building to be erected for the New York Consolidated Car Co., on Webster and Fourth avenues. The structure is estimated to cost $500,000.

OLEAN.—The Port Allegany plant of the Olean Glass Co. has been purchased by 10 Olean men who will build a gas plant to operate it.

OSWEGO.—Champion Wagon Co., Inc., has been incorporated; $25,000; Fred C. Hill.

SOLVAY.—The Anchor Barrell Corporation has been incorporated; $100,000; by E. L. Pierce, H. W. Jordan, E. D. Winkworth, Syracuse.

NORTH CAROLINA

RICH SQUARE.—Rich Square Electric Co. has been incorporated; $50,000; M. Bolton, J. T. Bolton and R. B. Boyce, to build light plant.

NORTH DAKOTA

FARGO.—The Dickinson Roller Mill Co. is building a 40,000-bushel elevator at Belfield.

OHIO

AKRON.—Bids for building Pleasant Valley bridge thrown out, to be readvertised. McArthur Bros. given contract for $80,000 North Howard street extension bridge.

ALLIANCE.—The Electric Furnace Co. has increased its capital stock from $100,000 to $200,000.

BRYAN.—Sloan Bros. are installing artificial gas plant here.

CANTON.—Following bridge contracts have been let: Bank street, to Peter Schissler, Canton, $8,300; Eckroatte bridge, to William Kupper, Cleveland, $3,700; Lexington avenue, Hahn Bros., Canton, $3,800; Warmington, Massillon Bridge Co., $5,200, substructure to Peter Schissler, $4,045; Crystal Springs, substructure to Hahn Bros., $7,100, and superstructure to E. J. Lander, $8,500.

CINCINNATI.—The Modern Machine Tool Co. has increased its capital stock from $70,000 to $115,000, all preferred 6 per cent.

CLEVELAND.—City Sheet Metal & Roofing Co. has been incorporated; $5,000; Max Greenberg, J. E. Fuerst and others.

CLEVELAND.—The Duplex Mfg. Co. has changed its name to the Duplex Mfg. & Foundry Co.

CLEVELAND.—D. C. Moon, general su-

perintendent of the Lake Shore road, announces his company may start building round house at Ft. Wayne, Ind., at an early date.

CLEVELAND.—Broadway Foundry Co. has been incorporated; $10,000; by William Katz, Albina Krach, Adolph Krach, Sara W. Katz and Louis A. Katz.

CLEVELAND.—Service Director Springborn, city hall, will open bids Sept. 10 for pipe and special castings and on Sept. 17 for compressed air or storage battery locomotives and charging plant for water works.

CLEVELAND.—Proposals will be received by the directors of public safety, city hall, until Sept. 5 for furnishing material, etc., for the construction of a brick building to be used as a machine shop on Croton avenue.

CLEVELAND.—Bids are to be opened for highway bridges in Ohio as follows: Sept. 4, Portsmouth, T. C. Patterson, county auditor; Toledo, Sept. 16, Charles Sanzenbacher, county auditor; Newark, Sept. 13, C. L. Riley, county auditor; Cleveland, Sept. 10, John F. Goldenbogen, commissioners' clerk; Fostoria, Sept. 20, J. H. Lennartz, county auditor; Coshocton, Sept. 5, Frank Mowrey, county auditor; Eaton, Sept. 13, J. F. Randall, county auditor; Warren, Sept. 15, W. R. Harrington, commissioners' clerk; Painesville, Sept. 8, W. A. Davis, county auditor; Marietta, Sept. 10, county engineer; Niles, Sept. 8, W. R. Harrington, commissioners' clerk; Youngstown, Sept. 24, I. M. Hogg, county auditor.

COLUMBUS.—Mt. Vernon Bridge Co. has contract for Big Darby bridge superstructure at $23,000. John Tougher & Co. has masonry at $33,000.

COSHOCTON.—The Coshocton Light, Heat & Power Co. has contracts for furnishing power for the Powers Coal Co. and the Harrison Foundry Co. Steam turbine plant will be completed in October.

DAYTON.—The S. H. Thompson Mfg. Co. has been incorporated; $100,000; Theodore H. Barlow, Samuel H. Thompson and John C. Darst.

LEBANON.—County Auditor T. C. Patterson says county is to spend nearly $100,000 on road and river improvements.

LISBON.—Columbiana Handle Works, recently burned, will be rebuilt.

LISBON.—The Thomas China Co. will erect at once a storage house and cooper shop.

MARIETTA.—The Producers' Supply & Tool Co. has changed its name to The Producers' Tool & Supply Co.

NEWARK.—Newark Ohio Tool Co. has organized with capital of $10,000; will use part of the Scheidler Machine Co., to make tools for boiler makers. John F. Gero, Newark.

TOLEDO.—The Dewey-Anderson Mfg. Co. has been incorporated; $50,000; R. C. Dewey, H. A. Anderson, R. D. Logan and others.

TOLEDO.—Chicago & Alton railroad gave Wisconsin Bridge Co. contract for building $150,000 steel bridge over Illinois river at Pearl.

TROY.—Joseph Blevins is having plans prepared for an ice plant.

WARREN.—The Vulcan furnace has been bought by D. H. Palmer and W. C. Pendleton, Illinois men. It will be equipped for making steel forms for concrete work.

WAUSEON.—Plans for $350,000 subway under Lake Shore tracks have been submitted to the mayor.

ZANESVILLE.—The Henry Coal & Coke Co. has been incorporated; $200,000; C. G. Henry, J. C. Glenn and others.

ZANESVILLE.—The Unique Furniture Co.'s plant was struck by lightning and burned to the ground.

ZANESVILLE.—The Pennsylvania Railway Co. will erect a substantial building at Trinway.

OKLAHOMA

DUSTIN.—The O. O. Rossan Clickless Lock Railway Joint Co. has been incorporated; $50,000; O. O. Rossan, L. T. Sheets, J. W. Smith.

TULSA.—Permits have been obtained by the McEwen Mfg. Co. for building steel foundry, blacksmith shop and warehouse.

OREGON

BROOKINGS.—Brookings Timber & Lumber Co. has had plans prepared for 250,000 foot capacity mill here. P. J. Shropshire is superintendent. Orders for machinery are being placed.

PORTLAND.—The Northwestern Electric Co. has filed plans for its proposed building at Tenth and Washington streets, eight stories, of steel, and will cost $750,000.

PORTLAND.—The Beaver State Motor Co. has bought five-acre site near Gresham for an automobile manufacturing plant. The first building will be 60 x 200 feet and cost $25,000.

PORTLAND.—Additional structure is to be built this fall by the Pacific Iron Works, Portland, Ore., at East Portland, where 6-acre tract has been bought. Structural shop will occupy 200 x 600 feet and there will be a foundry, pattern shop and machine shop.

SALEM.—S. N. Arnold and others have filed articles of incorporation; at $100,000; for the W. Stayton Power & Railway Co. It is planned to build a line from this point to Stayton.

SPRINGFIELD.—The Booth-Kelly Lumber Co. plans building $250,000 sawmill on the site of the plant recently burned.

PENNSYLVANIA

ARNOLD.—Ground has been broken for the plant of the United States Aluminum Co.

PHILADELPHIA.—Harry Publicker is to build $50,000 distillery.

PHILADELPHIA.—The Philadelphia Electric Co. has bought Neafie & Levy ship yards.

PHILADELPHIA.—Bureau of survey, city hall, is preparing plans for five bridges to cost $200,000.

PHILADELPHIA.—The Philadelphia Steel & Forge Co. advises it has installed in its rolling mill department a power plant which will increase its tonnage of finished bars 2,000 tons a month. A heat-treating plant is being installed and company is specializing on high grade steels for automobiles, locomotives and machine tools.

PITTSTON.—The Vulcan Iron Works has taken an order for 10 electric hoists for the Consolidation Coal Co., Fairmount, W. Va. An order for six hoists for New England now is being put through.

PITTSBURGH.—The Ohio Valley Electric Co. has bought holdings of the Carpenter Electric Light & Power Co. The Parkersburg & Marietta Interurban Railway Co. plans building a $200,000 hydro-electric power plant near Lowell, O.

SHARON.—The Sharon Steel Hoop Co. is spending $20,000 on safety devices.

SHARON.—Directors of the Sharon Foundry Co. have appropriated funds for rebuilding burned pattern shop.

SHARON.—Hoffman Mfg. Co., asking state charter, will build factory for making machinery. J. C. Hoffman and Charles Hoffman, Sharon.

SHARON.—Application has been made for the incorporation of the Hoffman Mfg. Co., by J. C. Hoffman, Charles Hoffman and Lawrence Helm. Ice creepers, light machinery and specialties will be made.

WEST CHESTER.—N. R. Rambo, county surveyor, is preparing plans for concrete and steel bridge here.

TENNESSEE

NASHVILLE.—F. B. Rohtert has bought the Roemer-Worrick Foundry & Machine Co.'s business and plant at Bowling Green, Ky.

NASHVILLE.—The Tennessee & Kentucky Railroad Co., organized to build an electric and compressed air road from this city to Adairville, Ky., has been incorporated; J. P. Helms, H. L. Sperry and others.

NASHVILLE.—The Hermitage Hygienic Heating Co. has been incorporated; $20,000. It will make stoves and has taken over the International Hygienic Heating Co., Florence, Ala.

TEXAS

HOUSTON.—The Vulcan Iron Works has been incorporated; $16,800; by J. Wood, G. H. Brown and F. W. Albright.

MEXIA.—The Mexia Light, Water & Sewerage Co. has completed its transmission line to its pumping station, and by Sept. 1 the pumping station will be operating.

PIEDMONT.—The Piedmont Mfg. Co. has been incorporated; $25,000; by Walter Morgan, W. C. Mobley and J. D. Moody.

SHERMAN—County commissioners have sold $35,000 in bridge bonds and work will start immediately rebuilding bridges carried out by floods.

VAN HORN.—The Van Horn Valley Land & Railway Co. has been incorporated; $1,500,000; to build standard gage railway 60 miles long and develop 500,000 acres of land.

WELLINGTON.—The Wellington Power & Light Co. has been incorporated; $10,000; by D. E. Goodwin, J. S. Goodwin and R. L. Ellison.

VIRGINIA

BRISTOL.—The Iron City Stove & Foundry Co. has increased its capitalization from $25,000 to $50,000; J. C. George, president.

STAUNTON.—The Naill Mfg. Co. has increased its capitalization from $15,000 to $30,000.

WASHINGTON

ABERDEEN.—The Aberdeen Woolen Mills Co. is to be organized as soon as buildings can be put in shape, machinery will be installed.

KALAMA.—Contract for building steel bridge across Johnson creek, near Woodland, awarded to the Portland Bridge & Iron Works, Portland, Ore., at $7,487.

OLYMPIA.—The state highway board has work under way or planned to be started within the next few weeks in various parts of the state that will cost $800,000.

PORT ANGELES.—County treasurer has received $50,000 from the state as an installment on the $300,000 in good road bonds voted in November, 1912.

PUGET SOUND NAVY YARD.—Bids will be opened Sept. 13 by Bureau of Yards and Docks, Washington, D. C., for erecting $250,000 shipfitters and boiler shop, 313 x 210.

SEATTLE.—Ferdinand Schmitz will build $500,000 hotel at South Alki.

SEATTLE.—The state has bought $300,000 of the road bonds authorized by King county some time ago.

SEATTLE.—The F. S. Lang Mfg. Co., 1927 First avenue South, will move to its new factory at 2756 First avenue South soon. The company makes electric ovens, ship ranges, ranges for hotels, etc.

SEATTLE.—The Caldwell Machinery Co. has sold to the Seattle Astoria Iron Works foundry equipment including cupola, core oven and metal ladles, made by the Whiting Foundry Equipment Co., Harvey, Ill.

SEATTLE.—The Puget Sound Electric Railway Co., a Stone & Webster concern, will install a $60,000 electric block signal system and renovate its tracks between Seattle and Tacoma.

SEATTLE.—The Caldwell Machinery Co. has sold to the Seattle Astoria Iron Works foundry equipment including cupola, core oven and metal ladles, made by the Whiting Foundry Equipment Co., Harvey, Ill.

SEATTLE.—The Metals Products Co., 1002 First avenue South, builder of ship bunks, steel shelving and hospital metal furniture, has completed a $4,000 order of furniture for St. Paul's hospital at Vancouver, B. C.

SEATTLE.—The Higgins Machinery Co., 810 First avenue South, maker of the Redding 3-minute belt clamp, plans building factory. A small foundry and equipment will be installed. C. E. Higgins is president and manager.

SEATTLE.—Paul Whitham, chief engineer of the Port of Seattle, has been instructed by the commission to draw plans for a dredge to cost approximately $200,000 with which to remove about 3,000,000 cubic yards of dirt for harbor improvement.

SEATTLE.—The Seattle Brass Co., Seventh avenue south and Andover streets, Charles P. Anderson, president, recently added three oil burning crucible furnaces to its foundry department and soon will install additional furnaces to increase melting capacity to 5000 pounds per heat to handle the large propeller business of the Pacific Coast. This company recently furnished the Heffernan Engine Works four propeller blades weighing 14,000 pounds for the steamer Mariposa.

SHELTON.—Bids will be opened by the county auditor Sept. 1 for building Howe truss bridge across the Satsop river.

TACOMA.—Plans have been completed for a $250,000 steel bridge, $100,000 freight shed for the Oregon, Washington Railway & Navigation Co.

WALLA WALLA.—A plan for a net-work of concrete roads has been outlined by Engineer W. C. McNowan. Would require $1,250,000 bond issue.

WOODLAND.—Fire recently damaged the plant of the Woodland Canning Co. $12.000. R. D. Lawson has not decided the question of rebuilding.

Penton's Book News

Publishers and Book Handlers

CLEVELAND

A Few of our Standard Publications.

PRACTICAL ALLOYING. By John F. Buchanan	$2.50
ALLOYS (Non-Ferrous). By A. Humboldt Sexton	3.25
ALLOYS AND THEIR INDUSTRIAL APPLICATION. By E. F. Law	4.50
ALUMINUM PRODUCTION AND ITS INDUSTRIAL USE. By Adolphe Minet	2.50
METHODS OF CHEMICAL ANALYSIS AND FOUNDRY CHEMISTRY. By Frank L. Crobaugh	2.00
THE BLAST FURNACE AND THE MANUFACTURE OF PIG IRON. By Robert Forsythe	3.00
BRASS FOUNDERS' ALLOYS. By John F. Buchanan	2.00
CAST IRON. By Wm. J. Keep	2.50
METALLURGY OF CAST IRON. By Thos. D. West	3.00
HOW TO MAKE CONVERTER STEEL CASTINGS. By Arthur Simonson	.75
THE CUPOLA FURNACE. By Edward Kirk	3.50
FOUNDRY PRACTICE. By R. H. Palmer	2.00
FOUNDRY WORK. By W. C. Stimpson	1.50
IRON AND STEEL (Encyclopedia) By Hugh Tiemann	3.00
IRON, STEEL AND OTHER ALLOYS. By Henry M. Howe	5.00
THE METALLOGRAPHY OF IRON AND STEEL. By Albert Sauveur	6.00
THE METALLURGY OF IRON AND STEEL. By Bradley Stoughton	3.00
PATTERN MAKING. By James Ritchey	1.50
PENTON'S FOUNDRY LIST. (A. U. S. and Canadian Foundry Directory)	10.00
THE PRODUCTION OF MALLEABLE CASTINGS. By Richard Moldenke	3.00
FOUNDRY DATA SHEETS. (An invaluable foundry manual)	1.50
BLUE BOOK OF AMERICAN SHIPPING. (The Standard American Marine Directory)	5.00
AMERICAN NAUTICAL ALMANAC	.50
USEFUL TABLES. (For the Navigator)	1.25
COURSE FINDER (For the Great Lakes). By Clarence E. Long	2.50
DEVIATION TABLES (For Detroit, St. Clair and St. Marys rivers). By Capt. Anderson	.75
LAKE SHIP YARD METHODS OF STEEL SHIP CONSTRUCTION. By Robert Curr	2.00
GREAT LAKES RED BOOK. (A complete Great Lakes Shipping Directory)	1.00
HON. PETER WHITE. By Ralph D. Williams. (A historical sketch of the development of Lake Superior iron industry)	2.00
TIME AND DISTANCE TABLES FOR GREAT LAKES	1.00
SCOTT'S GREAT LAKES COAST PILOT	2.50
QUESTIONS AND ANSWERS FOR MARINE ENGINEERS. By Theo. Lucas	2.00
THE LAKE SUPERIOR IRON ORE ANNUAL. (Statistical reports of Superior iron ore shipments, 1854-1912 incl.)	2.00
MY DEMON MOTOR BOAT. By Geo. Fitch	1.20
NAVIGATOR'S CHARTS. (Charts for the great lakes, rivers and coasts)	.50

We have other books on Electricity, Engineering. Fuels, etc., about which we would be pleased to furnish information upon request.

REMEMBER

"Any Book on Any Subject" is our Serving Capacity.

PENTON'S BOOK NEWS

CLEVELAND

WEST VIRGINIA

NORTH WARWOOD.—The Wheeling Steel & Casting Co. is making additions to its plant. Charles S. Dowler is general manager and C. B. Collingwood, superintendent.

WEIRTON.—Machinery is being installed in the new plant of the Wierton Steel Co.

WHEELING.—The Wheeling Steel Casting Co. is building an addition.

WISCONSIN

ALLIS.—Davis Mfg. Co. plans building $100,000 factory and office building, 250 x 29 feet. The company makes motors.

ALMOND.—The Almond Electric Co. has been incorporated to build and operate a power plant; $10,000; by Wm. Brunker, Oscar Culver and A. A. Lepper.

APPLETON.—The Riverside Paper & Fibre Co. will install a steam power plant. Among the requirements are three Wickes boilers, with Detroit stokers.

APPLETON.—The Killen-Walsh Mfg. Co., manufacturing gasoline tractors, has contracted with a New York house for the larger part of its output for four years' time. During the first year, 10 tractors must be furnished each month, and during the following three years, one tractor per day. The Appleton shops have just shipped three tractors to Cuba on this contract and are producing machines for foreign trade for delivery within three months.

BELOIT.—The Fairbanks-Morse Mfg. Co. in 30 days will have available 40,000 square feet of additional floor space at its Eclipse works here, as the machine shop, 192 x 224 feet in size, two stories high, started in the spring, is about completed. The building will be used exclusively for the production of small gasoline engines from 1 to 6 horsepower. All operations will be carried on under one roof, the building to be equipped for machining, erecting, assembling, testing and finishing.

BURLINGTON.—The Raymond C. Agner Co., automobile specialties, is preparing to produce several new devices, including a special grease cup and electric horn, and plans to increase its facilities. At the annual meeting last week, officers were elected as follows: President, Hugh Agner; vice president, Edward Brook; secretary, Dr. C. H. Meyst; treasurer, George Weiler. Raymond C. Agner was re-elected general manager.

DEPERE.—Common council has ordered a survey of the main bridge over Fox river ship canal to determine if a new bridge is needed. If the old bridge is condemned, a modern bascule type bridge will replace it.

EAU CLAIRE.—The Eau Claire Auditorium Association, capital $50,000, has been incorporated by W. K. Coffin, E. S. Pearsall, G. L. Blum and others to finance the erection of a large auditorium building of steel and brick. The tonnage required has not yet been estimated.

EAU CLAIRE, WIS.—The Phoenix Mfg. Co. is making delivery of four large tractor type of locomotives, and fifty sled ore cars to the McIntire Iron Co. at North Creek, N. Y. The outfit will be principally for winter use in hauling ore through the forests. The Phoenix company is building several tractors for log hauling for a Russian lumbering interest. Last year two were shipped to Finland for forestry purposes.

GREEN BAY.—Albert W. Delforge and A. C. Brehme, plumbing contractors, plan building a factory for making combination washboiler and heater designed by Miss Ione Vaughn, Green Bay. Mr. Delforge is making several models for demonstration to prospective investors.

IRON RIDGE.—The Iron Ridge Electric Light & Power Co. has been incorporated; $6,000; to build power plant; John Kloukner.

MADISON.—Mayor John B. Heim has signed the franchises granted to the Chicago & Wisconsin Valley Railway Co., which will build a system of local and interurban railways in western and southern Wisconsin. The company must build the line on East Washington street, Madison, before Jan. 1, 1914, or forfeit; Madison to Portage, Wis., by Jan. 1, 1915, or forfeit; before doing any work it must deposit $300,000 in approved bank and give bond of $50,000 to city of Madison. The company states it will be able to meet the conditions. It will be in the market for steel at once.

MILWAUKEE.—The Evinrude Motor Co. is working overtime to bring its production of detachable rowboat motors up to the volume of bookings. The company built a large machine shop a year ago and now is considering extensions. A few small purchases of tools are being made continually.

MILWAUKEE.—The Ellis-Klink Oil Co., capital $7,000, has been incorporated by Eugene Klink, A. A. Shead and Joseph Ennis.

MILWAUKEE.—The Aug. C. Beck Lumber Co. will erect a steel trestle over East street to connect its buildings, at a cost of $10,000. Henry G. Lotter is engineer.

MILWAUKEE.—Among the big Wisconsin employers who have elected to come under the provisions of the workmen's compensation act within the last few days are: Geuder-Paeschke & Frey Co., Milwaukee, 800 employes; Thomas Furnace Co., Milwaukee, 250 employes; Jung Brewing Co., Milwaukee, 150 employes.

MILWAUKEE.—The Chicago & Northwestern R. R. Co. has decided to rebuild its present passenger terminal, doubling its size; build a new express warehouse and depot; double its passenger terminal trackage, and extend its freight house and trackage facilities instead of constructing an entirely new combined freight and passenger terminal on the lake front. The work as planned will cost about $750,000 as compared with a $2,000,000 expenditure under the original plan.

OSHKOSH.—The Oshkosh Gas Light Co. has appropriated $150,000 for the buildings, pipe lines, containers and a complete equipment for the production of water gas as an auxiliary to the present coal gas plant. A new boiler house, steel tramway, hoists, and hydraulic elevator will be constructed. The work is in charge of William O. Wallen, general manager.

PALMYRA.—E. B. Heimstreet and Stanley B. Woodruff, owners of the Farmers' Mill & Elevator Co., have applied for a franchise to supply electric current within the city, and will ask the street lighting contract.

PLYMOUTH.—The C. F. Kade Fixture & Show Case Co. has established a plant for the manufacture of steel, metal and wooden goods for banks, stores and offices. The building contains 32,000 square feet of space and both C., M. & St. P. and C. & N. W. tracks pass in close proximity. Charles F. Kade of Sheboygan, is president and general manager.

PRAIRIE DU CHIEN.—The Prairie City Electric Co. suffered the loss of its power plant by fire. Plans are being made for immediate reconstruction. The insurance was $5,300, and about $10,000 will be expended in the new work.

RACINE.—At the annual sales convention of the United Refrigerator & Ice Machine Co. of Racine, it was announced that the company intends to add machines of 25 to 50 tons capacity to its line of products. The plan does not contemplate the erection of additional buildings, but some new and special equipment and tools will be required. Peter B. Nelson is president.

SHEBOYGAN.—This city is in danger of losing a large industry, the J. H. Optenberg Iron Works, unless promises made 20 years ago, when the plant was first established, are fulfilled. Mr. Optenberg was promised sidetrack facilities at the beginning, but these never were provided. Several offers to move to other cities are under consideration and may stimulate action. The Optenberg investment has grown from $18,000 to more than $100,000.

SUPERIOR.—Fire Chief A. Johnson has recommended to the common council that a municipal machine and repair shop be established, to care for fire departmental work and general city repair work. A building, 140 x 25 feet is proposed. Estimates are being prepared by the city engineer's department.

SUPERIOR.—The C. Reiss Coal Co., of Sheboygan, Wis., will spend $100,000 in enlarging its No. 1 coal dock on St. Louis bay, and has awarded a contract to Wales-Campbell Co. to lengthen the dock 600 feet, widen it several feet, and install a complete new equipment of hoists and rigs, electrically-operated.

WASHBURN.—The Hennepin Bridge Co., Minneapolis, Minn., received contracts for two steel span bridges for the county of Bayfield, at $12,000. Contracts for three bridges requiring more concrete than steel construction were awarded to Eben Olson Port Wing, Wis.

WATERTOWN.—The committee of Watertown business men which is soliciting subscriptions for a $100 000-fund for organizing a corporation to establish a malleable iron foundry here is meeting with success and there now is no doubt that the plan will be carried out successfully. A 2,000-ton per annum plant is contemplated. Otto Beifeld is chairman.